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Surgical Considerations in Diseases of the Pancreas

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SUMMARY

Present data indicate that surgical treatment of pancreatitis is most successful in cases in which the disease is caused by extrahepatic disease of the biliary tract.

Operation is also effective in cases of islet cell tumors, cysts, lithiasis, trauma and annular pancreas.

Results seem to justify radical operation for early carcinoma of the ampulla of Vater and pancreas.

The value of surgical treatment in other lesions of the pancreas is doubtful.

IN recent years important advances have been made in the diagnosis and surgical treatment of pancreatic disease. Operations for pancreatic lesions are being performed with increasing frequency as more experience in this relatively new field of surgery accumulates. Much remains to be accomplished in the recognition and treatment of pancreatic disease.

ANATOMY

The pancreas is located in a deep retroperitoneal position behind the serosal floor of the omental bursa traversing the upper abdomen and is in intimate relationship withe duodenum, the common bile duct and large vascular structures—the inferior vena cava, portal tributaries, the aorta and the superior mesenteric artery. The splenic artery grooves the superior surface and the tail of the pancreas is closely related to the spleen. The main pancreatic duct of Wirsung traverses the entire length of the gland and opens into the ampulla of Vater, usually in association with the common bile duct. Some controversy persists with regard to the incidence of an anatomic common channel for the common bile and pancreatic ducts. This incidence has been variously reported from around 30 to 40 per cent[11] up to 90 per cent.[9] The accessory duct of Santorini is usually present and communicates between the main duct and the duodenum proximal to the ampulla of Vater.

The pancreas has both exocrine and endocrine functions. Secretions elaborated by the acinar cells and discharged into the duodenum via the ductal system contain proteolytic, amylolytic and lipolytic enzymes. The islets of Langerhans, a separate histological component of the pancreas, are concerned with the hormone insulin and carbohydrate metabolism. They are said to be evenly distributed throughout the gland with more being present in the body and head because of the greater mass of pancreas in these areas.

Pancreatic secretions are under the control of both nervous and hormonal mechanisms. The vagi carry the secretory fibers to the gland, the sympathetic nerves being distributed to the blood vessels. When the duodenal mucosa is contacted by acid, the hormone secretin is elaborated, stimulating pancreatic secretion.

PANCREATITIS

The most commonly encountered pancreatic lesion is pancreatitis. The exact etiologic delineation of this disease remains obscure but experimental and clinical studies indicate several possible causative factors. Experimentally, when bile is injected into the pancreatic ducts of dogs, acute pancreatitis usu-

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ally occurs. Investigations by Doubilet and Mulholland[5] support the contention that a common passageway between the common bile and pancreatic ducts with reflux of bile into the pancreatic duct is the mechanism responsible for the development of acute pancreatitis in man. It is theorized that the reflux is incident to a stone or edema of the ampulla of Vater or spasm of the sphincter of Oddi. However, opinion is divided as to the incidence of a common passageway in the population as a whole and in the group of patients with pancreatitis. Pancreatitis has been reported on a number of occasions in aberrant pancreatic tissue in association with pancreatitis of the main gland. It is difficult to reconcile this phenomenon with the common channel theory. In such a case recently observed at Wadsworth Veterans Administration Hospital, radiopaque material was injected into the duct of Wirsung, which was exposed during distal pancreatectomy, and free flow into the duodenum, with no evidence of obstruction was observed.

Ligating the pancreatic duct and injecting secretin, in experiments with animals, can produce pancreatitis; and it is believed obstruction of the pancreatic duct by a calculus, stricture or tumor may be a causative factor in man. Trauma, including operative trauma, may be a cause of pancreatitis. Infection, circulatory stasis, thrombosis and embolism are thought to be etiological factors. The frequent coexistence of biliary tract disease in association with pancreatitis is well known, and it has been noted that many patients who have recurrent pancreatitis give a history of excessive use of alcohol.

Acute pancreatitis is frequently divided into two types, acute interstitial or edematous pancreatitis and acute hemorrhagic pancreatitis or pancreatic necrosis. Disease of the second type is considered by many to be a more pronounced degree or advanced stage of the first.

The diagnosis of acute pancreatitis is often difficult to make and, while it is not an uncommon cause of acute abdominal distress necessitating surgical intervention, in the past the diagnosis was not commonly made clinically. The disease is being recognized with increasing frequency, however. At Wadsworth Hospital the diagnosis was made in ten instances in 1948, 19 in 1949 and 30 in 1950. Although the disease is said to occur most frequently in middle age, in 65 cases of record at Wadsworth Hospital the incidence was fairly evenly distributed in each decade from 20 to 60 years. A history of alcoholism is frequently obtained (in 40 per cent of the cases in the Wadsworth series). The onset is usually sudden (67 per cent of the Wadsworth cases) with fairly severe epigastric pain as the first and most prominent symptom (96.8 per cent) of the cases in the present series). There is usually referral of pain to the back, and associated nausea with frequent vomiting. Upper abdominal tenderness and muscle spasm are early signs; but frequently, probably owing to the deep-seated position of the pancreas, there is less rigidity than would ordinarily be associated with other conditions producing upper abdominal pain of comparable severity. There is often accompanying abdominal distention, and reduction or absence of peristalsis.

The acute hemorrhagic form or pancreatic necrosis, much less common than the milder form, is attended by a high mortality rate (four deaths in five cases at Wadsworth Hospital). It is characterized by excruciating pain, shock, pallor, profuse vomiting and often pronounced abdominal distention. Discoloration about the umbilicus (Cullen's sign) or of the flanks (Gray-Turner's sign) may be present.

Determination of the serum amylase is a valuable and fairly accurate test in establishing the diagnosis of acute pancreatitis, although low values may be obtained in pancreatic necrosis and high values in acute cholecystitis and perforated or penetrating peptic ulcer with associated pancreatitis. Significantly elevated serum amylase may be present within six to 12 hours after onset and may persist for several days. Increase in the value for urinary diastase appears later, in 24 to 48 hours. The serum lipase test is generally considered less useful than serum amylase determination. In the more severe form of the disease a pronounced decrease in serum calcium may occur, apparently resulting from the formation of calcium soaps in and about the pancreas. A serum calcium level below 7 mg. per 100 cc. is considered fatal.

The current consensus is that medical management is the treatment of choice for acute interstitial pancreatitis, except when doubt exists as to the diagnosis. The control of pain presents a problem. The use of morphine is not thought advisable since it is known to induce spasm of the sphincter of Oddi. Using atropine or nitroglycerine as substitutes has been advocated but these drugs are not always effective. Success with block of the splanchnic nerves either with procaine locally or by Etamon® has been reported, but other investigators have not had uniformly good results with this procedure. The same is true of the intravenous use of procaine. Continuous epidural analgesia has also been employed. After the acute attack subsides, any coexisting disease of the biliary tract should be sought for and, if found, treated surgically. Surgical treatment for acute hemorrhagic pancreatitis has been advocated, drainage of the pancreatic area and T-tube drainage of the common duct having been suggested. The formation of suppurative pancreatic abscess or pseudocyst necessitates surgical treatment.

CHRONIC RELAPSING PANCREATITIS

The characteristic clinical feature of chronic relapsing pancreatitis is recurrent episodes of upper abdominal pain. The pain often lasts for days rather than a few hours as in cholecystitis, is often referred to the back, to the left flank or to the chest, and is not relieved by vomiting. Narcotic addiction is frequently associated with the disease. As the attacks recur there is permanent injury to the pancreas resulting from edema, hemorrhage and necrosis, producing disturbance in the function of acinar or islet tissue. There is ensuing weight loss, nausea and

vomiting, intolerance of food, anorexia, malaise and change in bowel habit. In spite of the fact that steatorrhea or creatorrhea may occur owing to deficiency in the external pancreatic secretion, constipation resulting from narcotic addiction and poor diet may be a prominent symptom. Excessive use of alcohol may precipitate an attack, but many patients say it acts as a temporary sedative and advance this as the reason for alcoholism.

Chronic relapsing pancreatitis may be treated surgically or by conservative means. Conservative management consists of supportive measures and opiates for pain during the acute attack, elimination of the use of alcohol, prescribing a bland low-fat diet, supplying pancreatin in cases of deficiency, and management of diabetes which may be present.

PANCREATIC CALCINOSIS AND PANCREATIC LITHIASIS

In general pancreatic calcinosis and pancreatic lithiasis are complications of chronic relapsing pancreatitis. However, occasionally large calculi may occlude the main pancreatic duct and thus be the cause of pancreatitis. In this rare circumstance, removal of the stones and T-tube drainage of the dilated pancreatic duct (Figure 1) may effect cure. The term *pancreatic lithiasis* is used to designate calculi within the pancreatic ducts. *Calcinosis* implies a more diffuse calcification. However, even when there appears to be diffuse parenchymal calcification, it is said that the deposits can be shown to lie within epithelium-lined cavities representing small ductules or acini. Patients characteristically have chronic, severe, demoralizing pain and have associated symptoms of pancreatic deficiency. Of 13 patients observed at Wadsworth Veterans Administration Hospital, seven were alcoholics, four had associated diabetes and five had pronounced symptoms of pancreatic exocrine deficiency.

SURGICAL TREATMENT OF CHRONIC PANCREATITIS

The surgical procedures used in the treatment of chronic relapsing pancreatitis may be considered as direct, indirect or a combination of direct and indirect.

Indirect Methods:

Cholecystectomy and Choledochostomy. The importance of eliminating any coexistent biliary tract disease is well recognized. This method is applicable only when such disease is present, however. In general, the best results with operative treatment are obtained in cases of that order.

Biliary Diversion. Cholecystojejunostomy and choledochojejunostomy have been performed in the hope of discouraging reflux of bile into the pancreatic ducts. Improvement following such procedures has been reported, but recurrences have often followed the remissions.

Sphincterotomy. This procedure attempts to overcome spasm of the sphincter of Oddi, for it is believed that the spasm causes reflux of bile into the pancreas. This procedure was carried out in six patients at Wadsworth Hospital. It is too early to fully evaluate the results. Doubilet and Mulholland[6] reported good results with this procedure.

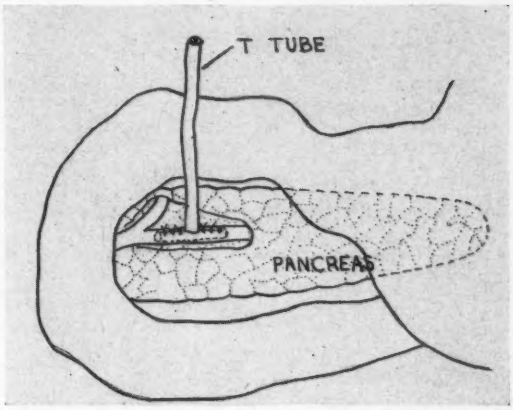

Figure 1.—Method of T-tube drainage following removal of stones from the pancreatic duct.

Operations on the Stomach. Richman and Colp,[12] who are advocates of this method, contend that subtotal gastric resection accomplishes diversion of the gastric contents from the duodenum and thereby reduces the tendency to spasm of the sphincter of Oddi and also reduces the response of external secretion to the ingestion of food. Results from this procedure have been reported as disappointing, however. At Wadsworth, one patient with chronic pancreatitis was unimproved by subtotal gastric resection.

Interruption of Sympathetic Nerves. This procedure is directed at the control of chronic pancreatic pain. Recent work by Bliss and co-workers[1] on the localization of referred pancreatic pain indicated that the sympathectomy should be bilateral. Vagotomy combined with sympathectomy has also been utilized. Reports as to the success of these procedures are conflicting.

Direct Methods:

Pancreaticolithotomy. On rare occasions large calculi are found blocking the duct of Wirsung, and removal of the calculi may be followed by good results. More frequently, however, the stones are distributed throughout the gland and removing them through the duct is impossible.

Ligation of the Duct of Wirsung. This procedure has been performed in several instances, but has not proven to be effective.

Pancreaticojejunostomy. Anastomosis of the duct in continuity to a loop of jejunum has been suggested by Cattell and Warren.[2]

Distal Pancreatectomy. This procedure is applicable only when the process is limited to the distal portion of the gland, as in injury to the body of the pancreas with stricture of the duct of Wirsung.

Pancreaticoduodenectomy. This procedure is reported by Cattell and Warren[2] as giving the best results of any they have employed for chronic relapsing pancreatitis and pancreaticolithiasis. The

TABLE 1.—*Operations for Chronic Pancreatitis Performed at Wadsworth Hospital*

Type of Operation	No. Cases	Improved	Unimproved	Not Followed	Died
Biliary Tract Operations	15	8	3	4	....
Sphincterotomy	6	2	2	1	1
Subtotal Gastric Resection	1	....	1	....	....
Abdominal Exploration	3	2	1	....	....

operative risk and technical difficulties are against its wide use.

Total Pancreatectomy. The mortality rate associated with this procedure has so far been too high to justify its use except as a last resort because of intractable pain.

Results of various means of surgical treatment of patients with chronic pancreatitis at Wadsworth Hospital are given in Table 1.

Carcinoma of the Pancreas. The difficulty of making an early diagnosis of carcinoma of the pancreas is well known. Usually the disease is not recognized clinically until after opportunity for cure is gone. The site of development has an important influence on what symptoms may occur and how soon the lesion will be discovered clinically. A neoplasm arising adjacent to the common duct, unlike lesions in the body or tail of the pancreas, may produce recognizable jaundice early in its development.

Contradictory to older teachings, pain is a prominent symptom in most cases of carcinoma of the pancreas. Of 37 patients with carcinoma of the pancreas studied at Wadsworth Hospital, 31 complained of pain. Characteristically the pain is dull, constant and boring in nature with frequent extension to the back.

There is a high incidence of loss of weight. Anorexia and vomiting are also prominent symptoms. In carcinoma of the head of the pancreas, the onset of pain consistently precedes the presence of jaundice. The opposite is true of carcinoma of the ampulla of Vater, in which pain is often absent. In addition carcinoma of the pancreas may give rise to obstruction of the duct of Wirsung, causing symptoms of external pancreatic deficiency.

The diagnosis of carcinoma of the pancreas is frequently difficult even at operation. Pancreatitis involving the head of the organ may be indistinguishable macroscopically from carcinoma. In addition there is frequently a certain amount of pancreatitis distal to the site of a carcinoma. Cattell[3] emphasized the importance of the presence of a dilated pancreatic duct which can be palpated proximal to a carcinoma.

The reported incidence of cases in which the tumor is resectable is discouragingly low. Cattell and Pyrtek[4] reported carcinoma of the pancreas and ampullary carcinoma was resectable in only 34 per cent of their series, while the corresponding incidence in cases of pancreatic carcinoma observed at the Mayo Clinic[10] in 1949 was 5.7 per cent.

Of 37 patients with carcinoma of the pancreas at Wadsworth Hospital, ten were subjected to cholecystojejunostomy, eight to pancreaticoduodenectomy (Whipple operation), ten to exploratory laparotomy, two to miscellaneous procedures; and ten were not operated upon. The average survival time postoperatively after exploratory laparotomy was two months. Although seven of the ten patients on whom cholecystojejunostomy was performed had some improvement following the procedure, only one of the ten was living five months postoperatively. Average postoperative survival time following cholecystojejunostomy was seven months. Of the eight patients subjected to pancreaticoduodenectomy, one died in the immediately postoperative period and five patients were living at the time of the analysis, three to 14 months after operation.

APPRAISAL OF PANCREATICODUODENAL RESECTION FOR CARCINOMA OF THE PANCREAS

There have been only isolated instances of five-year survival after resection for carcinoma of the head of the pancreas. Cattell and Pyrtek[4] in 1949 reported follow-up studies on 30 patients who had had resection for removal of carcinoma of the head of the pancreas and of 20 who had been operated upon for carcinoma of ampulla of Vater. Only 12 of the 48 survivors had been operated upon before 1944 and were suitable for study by the five-year measure of survival. Three of the 12 (25 per cent) were living and well five years after operation. These three had had ampullary carcinoma. Six of the 12 lived three years or more. Of 25 patients who survived pancreaticoduodenectomy for carcinoma of the head of the pancreas, 18 died after an average survival of 11 months. The longest survival period for any of the remaining seven patients was 41 months. Recent mortality rates for the operation vary from 7.3 per cent to 26.2 per cent.[2]

It would appear that resection for carcinoma of the ampulla of Vater is a procedure which achieves an acceptable degree of long-term survival with a reasonably low operative mortality. The results after resection for carcinoma of the head of the pancreas are poor. In spite of this it seems that an attempt should be made to remove a malignant lesion when feasible if there is any prospect, no matter how small, of successful outcome.

TRAUMA

Injuries to the pancreas are not common but the results of such injuries can be quite serious owing to hemorrhage, escape of activated pancreatic enzymes into the surrounding tissue, or diversion of the pancreatic secretion when the duct of Wirsung is divided near the ampulla. Traumatic injuries may be penetrating, non-penetrating or operative. Penetrating injuries in civilian life are rare but this possibility should be kept in mind in any penetrating wound in the upper abdomen. Non-penetrating wounds are more common and result from indirect force as in automobile accidents, falls, etc. Operative trauma may occur during procedures on the stomach, duodenum, biliary tract or spleen.

The clinical symptoms and laboratory data are similar to those in acute pancreatitis, and determination of the serum amylase level is a useful aid in diagnosis. Complications include acute pancreatic edema and necrosis, immediate or delayed massive hemorrhage, pancreatic cysts, pancreatic abscess, diabetes, steatorrhea, internal and external pancreatic fistulae, subdiaphragmatic abscess and pancreatic calcification. Initial care should be directed at control of hemorrhage, evacuation of hematomas, and adequate drainage. The skin should be protected by sump drain if a fistula occurs. A persistent fistula may be treated by distal pancreatectomy if it involves the body or tail of the organ. Persistent fistulas arising near the ampullary portion of the duct of Wirsung should be treated by anastomosing the duct to the jejunum.

Kipen[8] reported a case, from Wadsworth Hospital, in which pancreatic calculosis developed following trauma. In one other case of pancreatic trauma observed at Wadsworth, pancreatitis developed after a blow to the abdomen. It was necessary later to drain a pancreatic abscess.

PANCREATIC CYST

Pancreatic cysts may be divided into the following types: Congenital cysts, retention cysts, cystadenomas, and pseudocysts. Congenital cysts are only occasionally of surgical interest. They result from obstruction of the pancreatic ducts and lead to multiple cystic dilatations and occasionally to pancreatic insufficiency. They are often associated with atresia of the bowel, bronchi, cystic ducts and ureters.

The other cystic lesions of the pancreas produce symptoms of regional pressure or pancreatic insufficiency. The pressure symptoms depend on the size and location of the cyst. Duodenal, common duct, portal vein, ureteral or vena caval obstruction may result, or there may be torsion of omental vessels. There may be a rapid change in the size of the mass caused by hemorrhage into the cyst or discharge of the contents through pancreatic ducts. As the cyst enlarges and pushes forward, it may extend above the stomach (Figure 2), or between the stomach and the colon, or inferiorly to the colon.

Surgical treatment consists of excision, marsupialization and drainage, or internal drainage. Internal drainage may be carried out by anastomosis to a loop of jejunum or Roux-Y (Figure 3). Another method described is transgastric cystogastrostomy. Cattell and Warren[2] expressed the belief that there has been a recent tendency to indiscriminate use of internal drainage and stated that the procedure should be used more selectively. At Wadsworth Hospital, excision of a cyst was done in one case, marsupialization and drainage carried out in three cases, and internal drainage in two others. Good results were obtained with each method as far as recurrence is concerned.

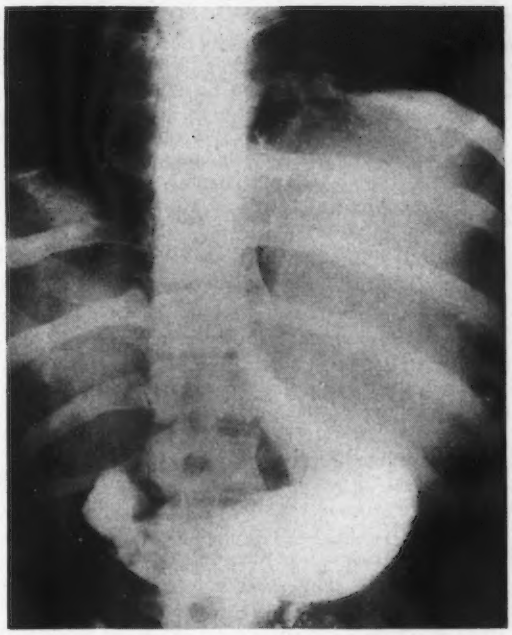

Figure 2.—Cyst in tail of pancreas producing extrinsic pressure defect on greater curvature of stomach.

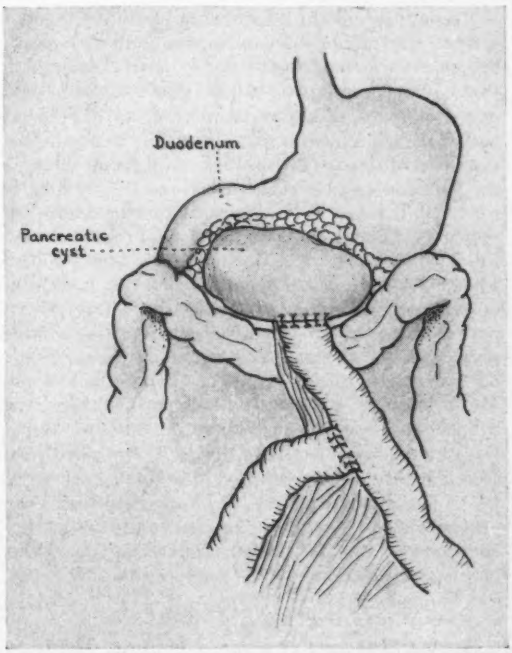

Figure 3.—A method of internal drainage of a pancreatic cyst.

ISLET CELL TUMORS AND HYPERINSULINISM

The first report of a case of tumor of the islets of Langerhans associated with hyperinsulinism was made by W. J. Mayo in 1926. Since then a number of these cases have been reported. The triad of observations which are cardinal features of the disease was first described by Whipple: (1) Attacks of nervous or gastrointestinal disturbances during the

fasting state that are (2) associated with a sugar content in the blood less than 50 mg. per 100 cc. and that are (3) relieved promptly when glucose is given. This condition must be differentiated from functional hypoglycemia. There is no single criterion for differentiation. Fasting blood sugar determinations are more valuable than tolerance tests, and a history of increasing severity and frequency of attacks is an indication of organic hyperinsulinism. A high protein diet often brings about improvement in functional hypoglycemia.

Howard, Moss and Rhoads[7] collected reports of 398 cases of islet cell tumor and hyperinsulinism from the literature. The tumors originated at one site in the pancreas about as often as in another, although there was a slightly higher incidence in the body and tail of the organ. There were multiple tumors in 12.6 per cent of cases. In seven cases the lesions occurred in ectopic pancreatic tissue. In 37 of 118 cases in which a tumor could not be located during the original exploration, an islet tumor was subsequently found to be present. In 12 of these 37 cases the tumor was removed when subtotal pancreatectomy was done, and in 12 others a tumor was found at re-exploration. Islet cell tumor could not be demonstrated in 81 cases. Partial pancreatectomy was performed in 56 of these with good results in 46.4 per cent.

Recognition of the adenoma at operation is often difficult, for often the lesion is small and of virtually the same consistency and color as normal pancreatic tissue. When no tumor can be demonstrated, there is a good possibility that it is present but is so small that it is not recognizable. In such circumstances, resection of the distal two-thirds or three-quarters of the pancreas has been advised. Good results may be expected if there is an adenoma present in the resected portion of pancreas; and good results sometimes occur even when no tumor is present. In experimental animals, 90 per cent of the pancreas must be resected to produce diabetes; and Stevens[13] reported a case in which all the pancreas but a small portion of the tail was resected for carcinoma without subsequent development of diabetes. At Wadsworth Hospital a patient with hyperinsulinism was subjected to exploratory operation and no tumor was found. The distal two-thirds of the gland was resected. After the operation the content of sugar in the blood, when fasting, did not return to the low preoperative levels, but the patient continued to have epileptiform seizures, which apparently were idiopathic and not related to hypoglycemia.

ANNULAR PANCREAS

Annular pancreas is a rare condition. There are only 54 cases reported in the literature and only 15 in which the patient was treated surgically. The correct diagnosis was made preoperatively in only one instance. All of the 15 patients operated upon had some degree of duodenal obstruction. Three had duodenal ulcers.

The condition caused symptoms in about one-third of the cases reported. Symptoms of duodenal obstruction, oddly enough, did not appear in some instances until the fifth or sixth decade of life. Lehman described as a roentgenographic characteristic a narrowing of the second portion of the duodenum with an indentation laterally. In a number of instances, however, only a segmental narrowing of the second portion of the duodenum with proximal dilatation was present.

The condition is characterized by a ring of pancreatic tissue around the second portion of the duodenum. The annular portion of the gland should not be divided or resected because of possible injury to the pancreatic duct and subsequent pancreatic fistula. In addition there is often an associated duodenal atresia which would not be relieved by such a procedure. Treatment consists of gastroenterostomy or duodenojejunostomy, the latter probably being the treatment of choice. If gastric or duodenal ulcer is present, gastric resection should be done.

One patient with annular pancreas was operated upon at Wadsworth General Hospital. The diagnosis was not made preoperatively. Gastroenterostomy was performed and symptoms were relieved. In roentgen studies, segmental narrowing in the second portion of the duodenum, with proximal dilatation, were observed.

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The *Don'ts* of Spinal Anesthesia

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SUMMARY

Spinal anesthesia is an essentially safe procedure with no unavoidable complications, except headache and backache in a relatively small number of cases, if certain well defined contraindications are observed and if there is rigid adherence to a careful and rational technique of administration and of preparation of materials.

SINCE spinal anesthesia is the most satisfactory for certain operations, public skepticism of it, which apparently is increasing in some localities, ought to be dispelled wherever possible. Some neurosurgeons[3] also censure the method, although not all of their objections are well founded; and it is probable their proposed interdiction of spinal anesthesia save in the few cases in which other methods are contraindicated would lead only to an increase in the number of complications from general anesthesia. Studies now in progress[1] would seem to indicate that there are fewer complications from spinal than from general anesthesia. With care born of knowledge of the pitfalls to be avoided in administering spinal anesthesia, these can be reduced even further. Headache and localized backache are the only complications which at present cannot be completely eliminated.

There is a strong testimonial to the safety of the method in the fact that over a period of 50 years spinal anesthesia has been given in a great many cases by relatively inexperienced physicians with astonishingly few complications.

To be sure, anesthesiologists must be cognizant of criticism and of possible complications and must attempt to improve their methods—but this applies also to general anesthesia. If spinal anesthesia is administered with the same careful consideration as general anesthesia, complications will be even fewer and no more serious. It is a method with merit, but, like many fine and delicate things, it must be handled with care. The majority of difficulties stem from improper choice of method or from careless administration.

Choice of method may be considered in the light of two major factors, psychologic and physiologic. Certain rules in the form of *do* and *don't* can be worked out.

Of the psychologic *don'ts*, the most important concerns prejudice against spinal anesthesia. Don't give spinal anesthesia to a patient who doesn't want it. No matter how annoying his attitude or how foolish his reasons may seem, respect his prejudices. Not always, but often, one should attempt to find out why the patient objects—it may be simply that he doesn't want to be awake. If so, the problem is easily solved. But no great effort should be made to change his mind unless there is a real indication for spinal anesthesia. A corollary is, do insist upon spinal anesthesia, even in the face of the patient's or the surgeon's objections, if the method is definitely indicated. The anesthesiologist's judgment and experience should be the final deciding factors and usually will be accepted without reservation if well explained.

The surgeon's objections should be respected, too, insofar as is practicable. Often an anesthesiologist will work with a surgeon whose personality is unsuited to spinal anesthesia. His objections to the method may stem from within himself, or they may be more objective; but, whatever they are, they ought to be considered as long as they do not endanger either the patient or the position of the anesthesiologist.

Physiologic contraindications are based on disturbance of the cardiovascular system and on disease of the central nervous system.

Don't give spinal anesthesia to patients with coronary artery disease, pronounced arteriosclerosis, valvular heart disease, aortitis or severe hypertension. The method requires of the cardiovascular system rather abrupt compensations, which often cannot be made if these diseases are present. It should be noted, however, that few of these contraindications are absolute; other factors in the patient's immediate situation may sway the balance in favor of spinal anesthesia.

Don't give spinal anesthesia to anyone with a very low hemoglobin content in the blood; 8 gm. per 100 cc. is considered the minimum. By its sympathetic blocking effect, spinal anesthesia increases the size of the vascular pool and creates a larger area for the already diminished hemoglobin to supply with oxygen.

For the same reason, don't use spinal anesthesia when the patient is in shock. The aim is to increase the circulating blood volume, not decrease it. The vasomotor system is already taxed to its limit trying to combat shock. It is not advisable to increase its load.

For a patient with a distended, obstructed bowel, spinal anesthesia is a poor choice, for two reasons: (1) sudden release of tension in the bowel may precipitate a vascular collapse from which recovery is difficult or impossible; and (2) there is danger of vomiting and aspiration of gastrointestinal contents.

Presented before the Section on Anesthesia at the 80th Annual Session of the California Medical Association, Los Angeles, May 13 to 16, 1951.

A final don't on the basis of cardiovascular disturbance is, don't use spinal anesthesia for operations above the diaphragm.

Contraindication of spinal anesthesia because of central nervous system disease is absolute if the disease is active; meningitis, multiple sclerosis, progressive muscular dystrophy, herpes zoster, and spinal cord tumor are some of the more common.

Don't use spinal anesthesia for patients who have had poliomyelitis or syphilis. Probably this is not a necessary *don't*, for there is little likelihood of doing harm. Perhaps it should be considered a psychological *don't*, based on fear that the method or the anesthetist will be blamed for possible subsequent developments.

Disease of the spinal column should be viewed in the same light. Infections of the bone, of course, should proscribe spinal anesthesia, and this is true also of fractured vertebrae. Recently, Smolik and Nash[4] reported a case of adhesive arachnoiditis following operation for protruded lumbar disc, with the patient under general anesthesia. It is likely that if the anesthesia had been spinal, that is where the blame would have rested.

Nevertheless, spinal anesthesia may and should be used for lumbar laminectomy, especially for large, heavy-set male patients who are such difficult subjects for general anesthesia.

There are two common diseases with central nervous system manifestations—diabetes and pernicious anemia—which must be considered with care. With pernicious anemia, general anesthesia should be the method of choice, but with diabetes regional anesthesia is frequently preferred. Here again caution undoubtedly springs from fear of being blamed for something which could have happened anyway and certainly is not caused by the injection of the anesthetic agent.

Extreme obesity, especially if the patient must be in the Trendelenburg position, is another contraindication to spinal anesthesia.

There remain the technical *do's* and *don'ts*.

Do take great care in preparation. Cleanse the patient's back well. Wear gloves. Drape adequately.

Don't use corrosive solutions to sterilize the ampoules. Keep the sterilizing solution well colored, so that if any of it enters the ampoule, it may be detected easily.

Do rinse needles before using.

Don't inject through infected areas. If there is furunculosis or dermatitis present, avoid the method if possible, but certainly avoid the area.

Don't inject in the presence of persistent paresthesia.

Don't inject if blood is aspirated when the tap is made.

Don't use spinal anesthesia if there is pain out of proportion to the suspected disease.

Do inspect the ampoules carefully, and do read the labels.

Don't use concentrated solutions. The maximums are: tetracaine, 0.5 per cent; procaine, 5 per cent; metycaine, 4 per cent; nupercaine, 0.1 per cent.

With regard to technique, make every move carefully and with reason when administering the anesthetic. Be swift but not hasty. In event of difficulty in inserting the needle, don't fret and press; stop, review the situation, reconsider the technique.

Don't forget the patient's comfort. See to it that he is in a position that would be comfortable if he were awake. Often a patient may be disturbed by the lingering sensation that his feet are in a different position than he knows they are. Wait until the anesthesia is effective before putting him in the lithotomy position. Place a folded towel or other support under the back. Many backaches could be prevented by this simple maneuver. The muscles and ligaments of the back may be relaxed and stretched more than they would be with any other form of anesthesia and thereby subjected to unusual strains. Remember also the mental comfort of the patient. Regulate adjuvant agents so that he is mentally reposed, or asleep if necessary.

If aspiration is difficult when the tap is made, or if the desired height of anesthesia is not obtained when the anesthetic agent is introduced, spinal block by a tumor should be suspected. If the agent has already been injected, it should be washed out with normal saline solution. This should be done also if the patient experiences pain after the injection.

Spinal anesthesia administered with care and good judgment is safe and valuable anesthesia, but it is always well to remember Eversole's[2] epigram: "The primary contraindication to spinal anesthesia is the absence of a spinal anesthetist."

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Oxygen Therapy

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SUMMARY

Oxygen, properly administered, often is a valuable therapeutic agent in many conditions such as hemorrhage, heart disease, respiratory diseases, anemia, shock, infection with fever and others in which there is direct or indirect interference with normal oxygenation of tissues.

In severe heart disease or acute respiratory conditions, administration of oxygen under pressure may be necessary in order to deliver the required amount to the tissues in want. For conditions in which oxygen want is less critical, 50 per cent concentration of the gas in the inspired atmosphere is effective and more easily carried out.

Patients with chronic heart disease may be greatly helped by taking oxygen at home under the direction of a physician.

OXYGEN is a drug and there are indications for its use and techniques for its administration, but there appears to be no contraindication. Oxygen as it is given clinically has no harmful effects. Although it is possible to produce toxic symptoms experimentally after 18 to 24 hours of continuous administration of 100 per cent oxygen, the problem of the practicing physician is how to get therapeutic concentrations.

INDICATIONS FOR OXYGEN THERAPY

Any situation in which the patient cannot supply adequate tissue oxygenation without the expenditure of energy beyond the ordinary effort of normal respiration constitutes an indication for oxygen therapy. It is apparent that this definition includes a multitude of clinical situations.

To list all the conditions in which oxygen is of benefit to the patient would be extremely time-consuming, but it is worth while to consider at least the classes of pathological states in which oxygen has definite value.

1. Hemorrhagic conditions in which the total quantity of hemoglobin is diminished, resulting in increased respiratory rate and tachycardia—both energy-consuming phenomena.

2. Cyanotic states in which the quantity of blood presented to the lungs does not become saturated, or in which the circulation is so impaired that the circulating blood is excessively desaturated. These conditions may be produced by a variety of clinical conditions such as (a) obstruction of air passages at any point, including an alveolus, (b) paralysis or paresia with a resulting loss of power of the muscles of respiration with a reduction in alveolar dilution, (c) cardiac or circulatory failure, including shock, resulting in a slowing of the circulation.

3. Demand states, which include fever, hyperthyroidism and other conditions in which none of the foregoing conditions exist, but in which the effort required to produce normal content of oxygen in the blood is at an ever-increasing cost in terms of energy expended.

4. Energy-sparing states including cardiac and respiratory conditions in which the patient gets along all right at a reduced level of activity but fatigues rapidly if that level is exceeded. Some patients with valvular heart disease, angina, and coronary disease are examples as are patients with asthma, emphysema, or fibrotic disease of the lungs.

MECHANISM OF ACTION OF OXYGEN THERAPY

It is not difficult to visualize the manner in which increasing the oxygen tension of inspired air is of benefit in conditions wherein the blood in its course through the lungs does not normally become exposed to a sufficiently high oxygen tension to thoroughly oxygenate it, as is the case in cyanotic conditions. When the oxygen content of the inspired air is increased, some of the nitrogen is displaced and the amount of oxygen in relation to the area of the lungs is increased. Thus, in these situations the elimination of carbon dioxide is enhanced by the effect that oxygen has on the dissociation of carbon dioxide from hemoglobin.

Less obvious are the reasons for the value of oxygen therapy in hemorrhagic conditions and in demand states and energy-sparing states. Probably that is why it is too little used in those conditions. For, although the hemoglobin is fully oxygenated as determined by tension studies, the amount of oxygen delivered to the tissues is subnormal. In anemia and other hemorrhagic conditions, even though every available gram of hemoglobin be saturated, there may be too little hemoglobin to carry enough oxygen for normal oxygenation of tissue. In demand and energy-sparing conditions, both oxygen tension and the content of oxygen in the blood may be within normal limits yet the tissues receive less than is needed. In the case of demand states, this is because of the inability of normally saturated blood to supply sufficient oxygen to the tissues without an increase in the rate of circulation of the blood—and to increase the rate would entail increased demand. In the energy-sparing states the reason for deficiency in tissue oxygenation in the presence of normal con-

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tent of oxygen in the blood is that the heart or lungs cannot do more than a limited amount of work without fatigue or failure and the patient spares the heart and lungs by curtailing activity to a comfortable level.

The value of oxygen therapy in these conditions rests in the fact that plasma has the ability of carrying oxygen in a small but significant amount, and the amount is determined by the tension of oxygen in the inspired air. The tension of oxygen in the plasma is, in the final analysis, the important factor in tissue oxygenation, for hemoglobin does not supply oxygen directly to tissues. Hemoglobin gives up oxygen to the plasma in direct proportion to the difference between oxygen tension of the plasma and that of the surrounding tissues: Plasma gives up oxygen to tissue with less oxygen tension, and the oxygen tension of the plasma is replenished from the oxygen carried in hemoglobin. The process is continuous until equilibrium is reached.

It has been observed that the administration of 100 per cent oxygen to non-cyanotic patients for as little as five minutes will increase the oxygen content of the whole blood to 110 per cent of its calculated capacity. The surcharge comes about entirely through an increase in the amount of oxygen in the plasma, which is in direct proportion to the oxygen tension in the inspired atmosphere. Often the increase thus attained makes the difference between hypoxia and adequate oxygenation.

Why oxygen therapy for periods of 15 to 20 minutes two or three times a day is so effective in relieving symptoms in patients with chronic cardiac and respiratory conditions is not clear, but that it is has been demonstrated many times. To illustrate:

A patient with severe mitral stenosis became thoroughly fatigued and mildly dyspneic on effort and could tolerate little activity. When 100 per cent oxygen was given by mask for 20-minute periods three times a day the patient more than doubled the degree of activity without dyspnea or evidence of fatigue. She was able to lie supine without discomfort, although she otherwise slept propped with several pillows. The organic state of the heart was not improved, but the patient was enabled to lead a more useful life.

METHODS OF ADMINISTRATION

The effectiveness of oxygen therapy depends upon the means of administration and the concentration of the gas in the inspired atmosphere. It is frequently desirable to administer 100 per cent oxygen, and in certain circumstances at increased pressure during the inspiratory phase. Therapy of that kind is particularly useful in cases of respiratory obstruction and in some energy-demand states such as acute heart failure or severe shock.

For administration of 100 per cent oxygen at or above atmospheric pressure it is necessary to use a face-fitting mask or other gas-tight mechanism such as an endotracheal tube. The flow of oxygen must be equal to or greater than a patient's minimum respiratory volume. It is, therefore, an expensive technique. There must be a reservoir bag in the system to accommodate the demand for instantaneous flow on inspiration, and this system must have a capacity equal to or larger than the patient's tidal air. Most commercial systems such as those made by Oxygen Equipment Manufacturing Corporation or Bennett-Megee have bags of 750 to 1,000 cc. capacity when they are distended and the gas flow is adjusted so that the bag is not quite collapsed at the end of the inspiratory phase.

Owing to the presence of water vapor and carbon dioxide, even though the inhaled atmosphere is 100 per cent oxygen by volume the maximum concentration that can be delivered to the alveoli is about 90 per cent.

By the use of intermittent positive pressure, the plasma content of oxygen can be made greater than is possible by other means. In this procedure, oxygen is delivered under pressure 5 to 20 cm. (water) more than atmospheric pressure. The technique requires apparatus with special valves, but it is very effective in cases in which not only high oxygen concentration but augmented ventilation is needed—for treatment of patients with carbon monoxide or barbiturate intoxication, for example.

Since it is necessary that close-fitting masks be used in the techniques described, it is important to guard against the possibility of stoppage of the flow of oxygen and to maintain constant supervision.

For the administration of oxygen in concentrations of from 100 per cent to 40 per cent the Oxygen Equipment and Bennett-Megee appliances are equipped with dilution orifices. The orifice is opened enough to supply the desired concentration and the oxygen flow is adjusted to keep the breathing bag properly filled. It is also possible, by special adaptation, to use the intermittent positive pressure apparatus for administration of concentrations of oxygen down to 20 per cent.

A more commonly used technique is the administration of oxygen through a catheter or a loose-fitting face-piece such as a Lombard mask. By such means, more acceptable to the patient and less demanding of supervision, oxygen concentrations of up to 40 per cent in the inspired atmosphere can be obtained. For supportive therapy in conditions such as fever and hyperthyroidism, and in postoperative recovery periods they are generally satisfactory. To supply concentrations of 30 to 40 per cent in the inspired atmosphere, oxygen flow of 7 or 8 liters per minute is necessary for the average adult. If given in lesser quantity, it is essentially wasted; if in greater, the flow of the oxygen may be extremely uncomfortable.

Because rapidly flowing oxygen dries mucous membrane, it should be humidified by passing it through fine orifices in a humidifier before it is administered. It is unwise to give oxygen by nasal catheter in cases in which the patient has suction tubes placed in the nose, for the restlessness that is

caused thereby, due to additional irritation, may in itself increase the oxygen requirements and defeat the purpose.

Oxygen tents have definite value in certain instances, particularly if cooling of the environment of the patient is desired. Supplying oxygen by this means is expensive and usually not satisfactory because of the meticulous attention required and the difficulty of keeping the tent gas-tight. The newer clear plastic hoods that seal about the neck, leaving the patient free to turn or be turned, are more effective for oxygen administration where other techniques are not feasible. With the hoods, the maximum concentration that can be obtained is 50 or 60 per cent.

Administration of oxygen intravenously was recently revived by Cole. The big problem with this technique is to introduce oxygen in bubbles so small that the gas is rapidly absorbed by the blood. Other methods of parenteral administration of oxygen have not been satisfactory.

Except in cases in which oxygen is used regularly two or three times a day, patients given oxygen therapy must be "weaned" ultimately in order that they may live on the amount of oxygen normally in the air. Abruptly discontinuing oxygen administration, and starting it again only if the patient obviously is in critical condition, is not in the best interest of the patient. If oxygen has been given at 100 per cent concentration, the concentration may be diminished and the pulse, respiration and blood pressure carefully observed. If the pulse rate and the respiration rate increase (the blood pressure may or may not decrease), the oxygen tension should be increased and then gradually diminished over a period of hours, with the pulse and respiratory rate as guides. The color of the skin is an unreliable and tardy indication of the condition of the patient. For patients who have been getting oxygen in 40 to 50 per cent concentration, weaning may be accomplished by turning the flow off for ten minutes, then on for ten minutes and gradually shortening the periods of flow until air alone is sufficient.

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Less Commonly Recognized Clinical Features of Amebiasis

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SUMMARY

Among the less commonly recognized clinical manifestations of intestinal and hepatic amebiasis are vague abdominal distress in the absence of diarrhea, symptoms like those of peptic ulcer, and symptoms of a kind that may be ascribed to psychoneurosis. Hepatic amebiasis may be confused with other diseases affecting areas above or below the right diaphragm, such as cholecystitis, viral hepatitis, pneumonia or pleurisy.

Adequate therapy in every case must include a course of a drug effective against hepatic involvement (chloroquine or emetine) and a drug effective against intestinal involvement (Diodoquin, Milibis, or carbarsone). Even in the absence of positive results of stool examinations, a course of antiamebic therapy is always justified as a diagnostic and therapeutic measure.

REPORTS of experience during and after World War II have made physicians in general aware that amebiasis is not exclusively a tropical disease, and most of them consider the disease when a patient complains of diarrhea, particularly if the diarrhea is acute, with discharge of blood. However, since the diagnosis may be missed (or erroneous diagnosis made) if diarrhea is not present to arouse suspicion, awareness of other, less forthright manifestations of amebiasis is important.

The occurrence of diarrhea is by no means a requirement for the diagnosis of amebiasis. Indeed, in chronic amebiasis the bowel movements may be entirely normal, or constipation may be present. It is noteworthy, moreover, that diarrhea may not be recognized as such by a patient unless it is severe. Close questioning is necessary, for to most laymen the word means frequent watery bowel movements. The more characteristic pattern of chronic intestinal amebiasis is the passage of one or more "mushy" stools a day. Not infrequently a war veteran denies having diarrhea, only to admit on further questioning that he passed one normally formed stool a day before military service and one mushy stool daily afterward.

Vague symptoms referable to the gastrointestinal tract, such as indigestion or indefinite abdominal pains, with or without abnormally formed stools, may result from intestinal amebiasis. Not infrequently in cases in which such symptoms are ascribed to psychoneurosis after extensive x-ray studies have been carried out, complete relief is obtained with antiamebic therapy.

Sometimes associated with amebiasis are symptoms like those of peptic ulcer but with no abnormality observable in x-ray studies. Then, after E. histolytica is noted in the stool and antiamebic therapy given, the symptoms of ulcer disappear. The reason for gastric distress as a concomitant of amebiasis is not clear; the phenomenon may be caused by reflex pylorospasm secondary to the colonic involvement.

Differentiating between acute amebiasis and acute appendicitis may be exceedingly difficult. In 85 per cent of cases of amebiasis, the cecum is involved.[4] Amebiasis of the appendix likewise occurs. In some instances, even the observation of E. histolytica in the stool may not rule out appendicitis and the clinical symptoms may be such as to dictate surgical intervention. In such circumstances it is imperative that emetine be given preoperatively. Even if amebiasis is not diagnosed preoperatively, if the surgeon upon opening the abdomen becomes suspicious of amebiasis from examination of the appendix or colon, emetine should be given immediately. Beginning treatment at this stage will prevent or greatly minimize the danger of amebic peritonitis, which often causes death.

Chronic amebiasis may simulate non-specific ulcerative colitis. Furthermore, non-specific ulcerative colitis may follow amebic colitis, in which case eradication of the amebae with proper therapy will not bring about a cure. Although lesions of the two diseases, viewed sigmoidoscopically, usually are distinctive, this is not always the case. It is therefore advisable that every patient with chronic colitis be given antiamebic therapy even though the organisms are not observed in repeated examinations of stools. A brief report of a case will illustrate:

> A young woman was examined at an excellent university medical center because of chronic diarrhea. Conditions observed in a sigmoidoscopic examination were consistent with chronic non-specific ulcerative colitis. Repeated stool examinations were negative for ova and parasites. The patient was told she had chronic ulcerative colitis and was discharged. The symptoms persisted and one year later the patient entered another hospital, received a course of antiamebic treatment and was immediately and completely relieved of symptoms. There was no recurrence in a two-year follow-up period.

In some instances following antiamebic therapy, residual symptoms such as mild pain and some frequency of bowel movement continue. Often in such circumstances the patient is overtreated with re-

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peated courses of amebicides and medicated enemata without clinical improvement. It seems logical that residual inflammatory changes (or additional disease such as a bacterial dysentery requiring other therapy) may be present, even after the amebae have been eliminated, and that they cause the symptoms mentioned. Treatment with diet and antispasmodics is indicated.

Allergic manifestations are not commonly mentioned. Eosinophilia is not a feature of amebiasis, and when it does occur is rarely over 15 per cent. In routine physical examination of soldiers with acute amebiasis it was not uncommon to note scattered rhonchi through both lung fields. This occurred in the absence of acute respiratory infection or history of asthma. Rarely was the patient aware of the condition and it abated during antiamebic therapy. In some instances patients who had repeated episodes of angioneurotic edema were not permanently relieved of the symptoms until incidental amebic infestation was diagnosed and treated. Although the foregoing were purely clinical observations, the conditions occurred frequently enough to seem significant.

SIGMOIDOSCOPIC EXAMINATION

In sigmoidoscopic inspection, if amebic disease is present in the rectosigmoid region ulcers of varying size can be seen, with fairly normal mucous membrane between the areas of ulceration. This is in contrast to the usual appearance in non-specific ulcerative colitis wherein the entire mucous membrane is granular, friable and abnormal. However, this differential point is not absolute.

When lesions are noted it is essential to obtain material for microscopic examination. It is practically useless to attempt to get a proper specimen with a cotton swab. Use of an instrument with a dull small curette at the end is advisable, so that the ulcer may be gently scraped and all the material obtained saved for immediate examination.

Amebiasis may be present even though the rectosigmoid region appears to be entirely normal, since the lesions may be elsewhere in the colon.

STOOL EXAMINATIONS

For the highest degree of accuracy in examination of stools, the specimens must be collected properly and examined by well trained and experienced technicians. In examination for the trophozoites, freshly passed stools are essential. Administration of a saline laxative with immediate examination of the resulting diarrheal stools sometimes facilitates diagnosis. Specimens of formed stools are satisfactory for use in search for cysts, but the diagnosis should not be made on the basis of an unstained preparation alone. It is always wise to verify suspicious cysts with an iron-hematoxylin stain. With the development of good preservative material it is now possible to send specimens by mail to laboratories which are equipped to carry out these procedures.

Since the finding of the amebae can be so difficult, no examination should be considered complete until six to nine specimens have been examined.

COMPLICATIONS

Intestinal. Severe bleeding and perforation are very rare complications of intestinal amebiasis. Chronic ulcerative colitis and the "irritable colon" syndrome were previously discussed.

Hepatic. This is the most common complication. On routine physical examination of soldiers with acute amebiasis, in about 20 per cent of cases enlargement and tenderness of the liver were noted. The condition abated when antiamebic therapy was carried out.

Sixty to 90 per cent of patients with hepatic amebiasis have a history of diarrhea. In 60 to 75 per cent of cases the organism is noted in the stools. Therefore, neither the absence of a history of diarrhea nor the absence of E. histolytica in the stools excludes the diagnosis. The term "hepatitis" is actually a misnomer since there is not a diffuse inflammatory process throughout the liver, but localized areas of involvement. Likewise the term "abscess" is incorrect inasmuch as the involved area, unless secondarily infected, does not contain pus, but merely necrotic and autolyzed liver tissue.

The characteristic clinical features are chills, fever, and pain and tenderness in the right upper quadrant of the abdomen and in the lower part of the chest on the right side. Frequently observed in fluoroscopic examination of the chest are elevation, deformity and splinting of the right diaphragm. Jaundice other than of a very mild degree is rare. From this typical form there are all gradations to entirely asymptomatic cases. In epidemic areas hepatic lesions not infrequently are noted at autopsy in cases in which there was no clinical evidence of disease of the liver. The disease may be manifest in morbid process above the diaphragm on the right side. One such case was that of a soldier who was admitted to an overseas general hospital after an illness of one week characterized by chills, fever and pain low in the chest on the right side. Upon examination pleural effusion on the right side was noted, and aspirated material contained many lymphocytes. Low grade fever continued and the diagnosis was tuberculous pleural effusion until the patient's field medical records arrived and it was noted in them that earlier the liver had been palpable and tender. E. histolytica then were observed in the stool. Antiamebic therapy resulted in immediate disappearance of all signs and symptoms.

Another patient who had been hospitalized for dental extractions at another excellent medical installation was transferred for treatment of "arthritis" of the right shoulder. Careful questioning and examination elicited that pain in the right shoulder was referred from the right side of the diaphragm, which was elevated and splinted. E. histolytica were present in the stools. Following antiamebic therapy the "arthritis" abated.

Differentiating between acute gallbladder disease and acute hepatic amebiasis may be exceedingly difficult. X-ray studies of the gallbladder and a diagnostic trial of antiamebic therapy may be nec-

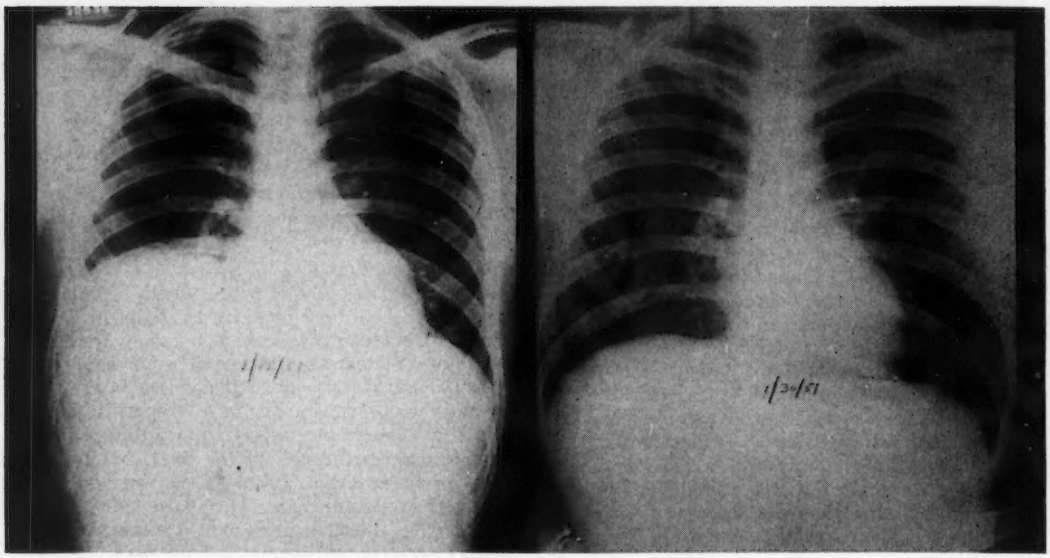

Figure 1.—*Left*—Chest roentgenogram taken before treatment. *Right*—18 days later: return of right diaphragm to normal position with clearing of the neighborhood reaction at the right lung base.

essary to differentiate the two conditions. To illustrate: A 25-year-old male was admitted to hospital with complaints of chills, fever, and pain in the right upper quadrant of the abdomen. There was pronounced tenderness in the painful quadrant of the abdomen and in the rib cage low on the right side. The patient gave a history of diarrhea while serving in the armed forces. E. histolytica were observed in the stools. Antiamebic treatment was carried out and all symptoms disappeared within a few days. X-ray studies of the gallbladder were not done. The patient returned several months later with identical complaints. The gallbladder could not be visualized by x-ray and the diagnosis of cholecystitis and cholelithiasis was proved at operation.

An amebic liver "abscess" may rupture spontaneously. Fortunately, in most cases rupture is into a bronchus, but rupture into any neighboring body cavity or organ may occur.

TREATMENT

Since hepatic involvement is common in amebiasis and since this feature may not be clinically apparent, it is essential that each patient be treated with drugs which will eradicate both the intestinal and the hepatic foci.

Emetine. Until recently emetine was the only drug which was of value in the treatment of hepatic amebiasis. The dangers of this drug have been tremendously exaggerated. However, to minimize the possible toxic effects of this drug it is necessary to keep the patient at rest in bed. In recent years chloroquine has been shown to be very efficacious in liver disease and since this drug is practically non-toxic and does not require restriction of the patient's activity, it is now the drug of choice. Thus emetine is limited to use, preoperatively and postoperatively, in cases in which the patient cannot take medication orally, and in the rare cases of amebic granuloma of another site. The usual dose of emetine is 0.065 gm. parenterally each day for six to ten days depending on the size of the patient and the severity of the disease. In cases of definite amebic "abscess" of the liver, it will usually be necessary to give a second course of emetine (if chloroquine is not used) after a short rest period. While this therapy is being given, the patient is kept at rest and carefully observed as to blood pressure, pulse rate and evidence of peripheral nerve involvement. Some change may be noted in electrocardiograms, but this will rarely be of significance in the absence of clinical evidence of toxicity when the drug is used as outlined above.

Chloroquine. The effectiveness of this drug in hepatic amebiasis is based on its extensive localization in the liver[2] (some 500 times its plasma concentration). The usual dosage is 0.5 gm. twice daily for three days following 0.25 gm. twice daily for a total of two weeks. (See Figures 1 and 2.)

Intestinal drugs. Since neither emetine nor chloroquine is highly effective in the treatment of intestinal amebiasis, it is imperative that other medications which will eradicate the primary intestinal focus be given. The effective drugs in this group are the iodo-hydroxyquinolines (Diodoquin,® vioform and chiniofon), carbarsone and Milibis.® The author's experience has been mainly with Diodoquin and it has been found to be an exceedingly efficacious drug with practically no toxicity. The usual dose of Diodoquin is three tablets (0.63 gm.) three times daily for three weeks.

Antibiotics. In recent years there have been some favorable reports on the use of aureomycin in the

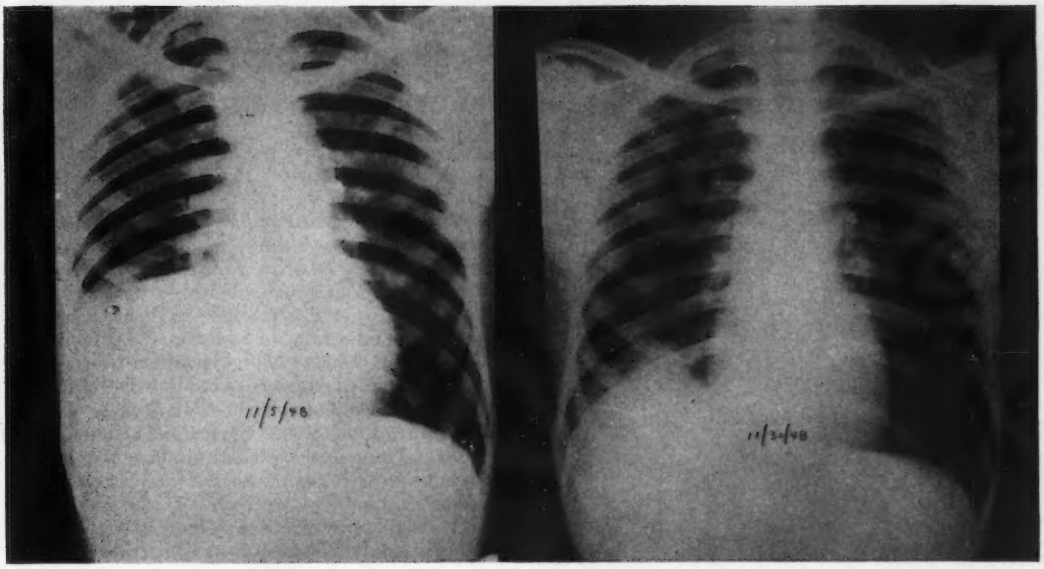

Figure 2.—*Left*—Roentgenogram before therapy in which it was noted that right diaphragm was elevated and splinted, with some reaction at the base of the right lung. *Right*—25 days later: considerable improvement but not complete return to normal.

treatment of amebiasis. However, experimental studies on monkeys[1] and one recent clinical report in the treatment of 25 patients,[3] very strongly question the value of this drug as an amebicide. Until there is further evidence in its favor and since more certain drugs are available, aureomycin should not be relied upon as the sole agent in the treatment of amebiasis.

Thus, from the standpoint of effectiveness, lack of toxicity and lack of necessity for restricting the activity of the patient, a course of chloroquine for two weeks and a course of Diodoquin for three weeks (or one of the other effective intestinal drugs) is the treatment of choice in amebiasis.

Drainage of liver "abscess." In many instances of long standing and large amebic "abscesses," conservative treatment alone will not cure the patient. Removal of the necrotic material becomes necessary. The method of choice is closed needle aspiration, with local anesthesia. The site for puncture is the most tender point in the right intercostal spaces, which will usually be the eighth or ninth right intercostal space in the anterior or mid-axillary line. In all instances, unless aspiration seems imperative as an emergency procedure, it should not be done until the patient has received chloroquine or emetine for several days to prevent the spread of amebae into the pleura or peritoneum. Open surgical drainage results in a tremendously higher mortality rate and should be used only if there are secondarily infected abscesses which do not respond to antiamebic therapy, antibiotics and closed aspiration.

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Planned Resection of the Regional Lymph Nodes in Pneumonectomy for Carcinoma

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SUMMARY

Although there has been a reluctance to include the regional lymph nodes in pneumonectomy for cancer because of the supposed inaccessibility of the nodes, radical removal of the nodes within the thorax is a feasible procedure.

Failure to include the regional nodes in pneumonectomy for cancer violates the accepted principle of inclusion of the regional lymphatics in operations for cancer. If pneumonectomy is indicated for removal of a malignant lesion, then removal of the regional nodes is also indicated. Injection of a dye helps the surgeon in identification of lymphatics to be excised.

IMPROVED anesthesia, perfected techniques and the introduction of antibiotic therapy have made pneumonectomy for carcinoma of the lung a relatively safe procedure. However, one important phase of the treatment which remains undeveloped is the inclusion of the regional lymph nodes as a part of the operation. The principle of inclusion of adjacent nodes is recognized as an essential part of well planned operations for dealing with cancerous lesions elsewhere, notably in the breast, the colon, the stomach, the uterus and the thyroid gland. While it is generally recognized that this principle is equally important in dealing with cancer in the lungs, it has been considered impracticable to extend resection beyond the immediate confines of the root of the lung because of the supposed inaccessibility of the more distant but equally important nodes in the mediastinum.

The close inter-relationship between the lung and regional lymph nodes is conspicuously evident in the early extension of the disease along the lymphatic pathways. Occasionally, even in cases in which the patient died of the disease, the spread is observed to be confined to the lung and its lymphatic communications within the thorax.

While the surgical mortality in connection with pneumonectomy for cancer has greatly decreased over the past few years, the average time of survival following resection has not improved proportionately. The explanation may lie in the fact that the regional lymph nodes have not been included in the resection. In 1950, Churchill and associates[1] reported upon a number of cases in which lobectomy was done for removal of malignant lesions because it was considered that the patients would not withstand pneumonectomy. The survival time was comparable to that obtained by pneumonectomy. There are several possible explanations for this, but the author believes it should be interpreted as a weakness in methods of performing pneumonectomy rather than as a favorable commentary on lobectomy. As long as the treatment of carcinoma of the lung remains surgical, there will be indications for lobectomy; but if cancer is to be dealt with in a logical manner, this limited operation should be performed only on functionally handicapped patients who cannot withstand the more extensive procedure of radical pneumonectomy with the inclusion of the regional lymph nodes. In this respect it is noteworthy that practically all of the progress in recent years in treatment of cancer of the breast has been through more extensive removal of lymph nodes, even in the region of the neck and intercostal spaces. Exactly the same principle of wide excision applies in performing curative operations for bronchiogenic carcinoma. To advocate removal of only the hilar nodes is to offer "lip service" to lymphatic resection, and if the longevity records following operation for cancer in other regions are indicative, no improvement in the statistics of longevity following pneumonectomy may be expected until the lymphatic resection has been made to extend well beyond the region of the hilum.

The failure to include the lymph nodes and lymph vessels beyond the hilum has been due chiefly to a lack of familiarity with the surgical anatomy of the mediastinum. It has been generally held that extension of the dissection into the spaces between the trachea and its adjacent structures such as the superior vena cava, the aorta and the esophagus, would invite such great hazards that attempts in this direction would be unwise. This is an erroneous concept. The removal of the more distant lymph nodes with their associated areolar tissue not only is feasible but actually simplifies the removal of the lung by clearly exposing the main blood vessels of the pulmonary root, thus making it easier to ligate and divide them.

At the Long Beach Veterans Administration Hospital a study of the lymphatic channels of the thorax has been carried on for the past two and a half

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years. This study is the outgrowth of investigations with staining of the lymph nodes of the thorax during operation. One phase of the study was concerned with the mapping of the regional nodes according to the specific areas of the lung with which they communicate. When a dye was injected into certain areas of the lungs, the associated nodes became stained by the uptake of the dye. It was noted that in most cases the upper part of the right upper lobe drained lymph to the azygos, hilar, and right paratracheal nodes; and the lower portion of the right lung drained to the subcorynal and hilar nodes. The upper portion of the left upper lobe drained chiefly to the nodes within the window of the aortic arch, and also to the hilar and paratracheal nodes. The midportion of the lung, including the lingula, drained chiefly to the hilar, paratracheal and subcorynal nodes; while the lower portion of the lung drained chiefly to the subcorynal, and hilar nodes. There was also uptake of the dye by the more distant nodes either directly or through the mediation of the nodes near the root of the lung. The pathways corresponded with those previously described by Rouviere[2] and by Delamere and associates[3] in their complete and detailed monographs on the lymphatics in man.

In the course of the study it became evident that the various groups of nodes within the thorax which commonly receive metastases from the involved lung may be safely removed together with the lung during the operation of radical pneumonectomy. Furthermore, it was found that in most cases it was possible to remove the nodes en bloc with the lung, thus fulfilling one of the important requirements for ideal surgical treatment for cancer. As would be expected, the additional steps required for the extensive resection of the lymph nodes extended the time of operation, usually by an hour or an hour and a half, but this did not affect postoperative convalescence.

The method devised by the author for identification of regional nodes during operation has been previously described,[4] and the details of the procedure for staining the regional nodes of the lung will be published elsewhere.[5] Therefore, only a brief description of the method of vital staining will be given here. Pontamine® sky blue in 4 per cent aqueous solution is mixed with hyaluronidase (Wydase,® 6 units per cc.). Four or five cubic centimeters of the mixture is injected into the pedicle of the lung at the beginning of the operation, and within a few minutes the dye reaches the regional lymph nodes, imparting to them a blue color which differentiates them from the surrounding tissues. While uptake of the dye occurs without the aid of hyaluronidase, the staining of the nodes is more rapid, more intensive and more extensive if this agent is added. With the visual aid of the vital staining, a surgeon is less likely to overlook nodes which might otherwise remain obscured because of small size or resemblance to surrounding tissues.

While the procedure of vital staining is helpful, it is not essential for the performance of meticulous removal of the lymphatics which should be included in the resection. Removal of the nodes and areolar tissue en bloc averts the possibility of skipping an area. The surgeon has the advantage, in the thorax, of dealing with nodes which are already pigmented by anthracosis, and while this is not an infallible aid, it does reveal many of the nodes.

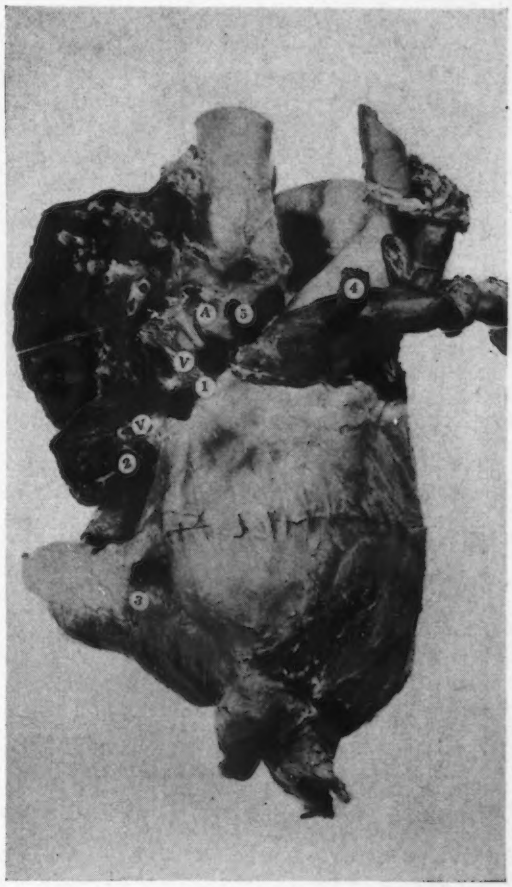

Figure 1.—Right anterior view of anatomical specimen including mediastinal structures and portion of right lung, with regional lymph nodes. *A*—right pulmonary artery; *V.V.*—superior and inferior pulmonary veins. Only a part of the regional nodes are shown in this view. Attention is directed to the Group 5 nodes which lie between the superior vena cava anteriorly, the right pulmonary artery and trachea posteriorly and the arch of the aorta medially. The superior vena cava has been displaced to the left to reveal this group of nodes.

While the normal direction of flow of lymph from the various segments of the lungs has been completely described,[2,3] and the description has been confirmed by the author's studies with vital staining, this knowledge is not particularly applicable in performing the operation of radical pneumonectomy. As the direction of flow is so frequently altered by various influences such as inflammatory blocking by anthracotic particles and particularly by obstruction of normal pathways by malignant cells, it is important that all regional nodes be removed in each case in which pneumonectomy is per-

Figure 2.—Left anterior view reveals the aortic window formed by the arch of the aorta and the left pulmonary artery (*A*). The ligamentum arteriosum (*11*) forms a barrier to the approach to the nodes within the "window." Its division between ligatures facilitates the thorough removal of the important group of nodes within the space.

formed with the object of curing the patient. To do less would be as illogical as to remove only the lymph nodes associated with the segment in which the lesion occurs when operating for cancer of the breast.

The general plan of radical pneumonectomy which was developed as a result of the previously mentioned studies is to begin with resection of the lymph nodes along the innominate veins and their tributaries at the cupula of the parietal pleura and carry the dissection in continuity toward the pulmonary root, including the nodes along the subclavian vein and the innominate vein, the paratracheal and anterior mediastinal nodes, and, on the right side, the para-azygos nodes. The dissection differs in the right and left hemithoraces because of anatomical differences, the superior vena cava altering the procedure on the right side, and the aortic window requiring special consideration on the left side (Figures 1 and 2). The dissection from the diaphragm toward the hilum is essentially the same for the two sides.

It has been argued with some justification that over-zealousness in extending the resection in the treatment of carcinoma should be guarded against, lest the patient be so handicapped by the radical dissection that the resulting infirmity be worse than the original disease. The criticism is not a valid one, however, with regard to inclusion of the regional lymphatics in pulmonary resection. The chief handicap which may be induced by pneumonectomy is pulmonary insufficiency. The only hazard which may arise from inclusion of the lymphatics is the immediate hazard of injury to vital structures during the dissection. The chief considerations in determining whether or not radical pneumonectomy should be performed are whether the cancer is sufficiently limited to justify resection, and whether or not the patient will be able to tolerate the removal of the lung.

If pneumonectomy is indicated, then the inclusion of the regional lymphatics is also indicated. Pneumonectomy with the inclusion of lymph nodes has been carried out by the author in 18 patients over the past two and a half years. It is too early to evaluate the procedure in terms of longevity. However, it is believed that this is a rational step in that it applies the same principles in dealing with the lymphatics in this situation as are applied in the treatment of carcinoma in other situations.

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Pulmonary Resection in Tuberculosis

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SUMMARY

Newer surgical and anesthetic techniques and the use of streptomycin and para-aminosalicylic acid (PAS) have made possible increased success in pulmonary resection for tuberculosis. Especially in early cases, however, bed rest and pneumothorax or pneumoperitoneum should be given adequate trial before resection is decided upon. In all cases a thorough bronchoscopic examination should be made first and the findings carefully evaluated.

Pulmonary resection may be advisable for lesions of certain kinds which do not respond well to thoracotomy; for lesions which have not responded to trial of other methods; for a lung destroyed by tuberculosis; and in cases of active disease in an unexpanded lung.

The experience of the author and of others emphasizes the importance of correct postoperative care. Since tuberculosis is rarely limited to the resected area, at least six months' rest in bed under medical supervision is necessary to permit cure of residual disease. Streptomycin with PAS is particularly valuable in the postoperative period; therefore indiscriminate use of it in earlier treatment should be avoided lest resistance develop.

THE tremendous advance in thoracic surgery in the past 15 years has opened new approaches to the control of tuberculosis. The improved technique of individual ligation and hilar dissection, together with the strides in anesthesia, blood replacement methods and by no means least the advent of the antibiotics gave thoracic surgeons confidence in development of effective excision of pathogenically involved segments of the lungs. This was first demonstrated in the successful handling of non-tuberculous conditions, with reduction in morbidity and mortality to a respectable figure. Phthisiologists readily admit that permanent collapse therapy, while effective in the arrest of active tuberculosis in a large percentage of cases, is objectionable because it entails multiple operations, permanent deformity of the chest, and in many cases, pulmonary suppuration due to compression of the diseased lung. It was, therefore, reasonable for surgeons interested in thoracic disease to consider excision of the local lesion as a means not only to circumvent the objectionable features of thoracoplasty but to provide a better chance for complete cure.

The first pulmonary resections for tuberculosis appeared extremely successful and improvement was noted in x-ray films. Unfortunately, early ambulation was permitted in many instances and the preliminary encouragement was followed by despair when new or reactivated lesions appeared in the remaining lung several months after operation. This unfortunate turn of events brought about a reevaluation of the entire problem, and the literature soon was flooded with reports from reliable sources regarding the role and effect of resection in the treatment of pulmonary tuberculosis. As a result of this intensive study by so many careful and qualified observers, there have been periodic episodes of enthusiasm as well as pessimistic forecast with regard to the radical surgical approach to what has been commonly interpreted as a generalized rather than a localized disease. Against this vacillating background, the present discussion must of necessity be influenced by the experiences of other surgeons as well as those of the author.

EARLY EXPERIENCE

During the years 1945 and 1946, the author, then in army service, was located at Fitzsimons General Hospital, near Denver. In a period of 12 months 30 patients with tuberculosis were subjected to pulmonary resection. Immediately following operation there was one death and three cases in which the disease spread. Rest in bed was not insisted upon following operation, and nine months later two of the remaining 29 patients died of tuberculosis and there was spread of the disease in seven additional cases. Postoperative pleural suppuration was not a problem. Careful investigation brought out three main facts which were felt to be responsible for the poor results. First, the case selection was not good. Many of the patients had bilateral disease, and lobectomy was performed with the idea of removing the "feeder" cavity. At operation in the majority of such cases, extensive active disease was found in the adjoining lung and the excision of the larger cavity was not effective. Second, overdistention of the remaining lobe or lobes following resection frequently brought about activation of lesions felt to be dormant at the time of operation. Third, it was believed that ambulation was permitted too soon after operation. Reports of excellent progress of patients who were ambulatory soon after lobar resection for diseases other than tuberculosis were so impressive that the premise generally accepted as fundamental, that tuberculosis is rarely, if ever, a localized dis-

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ease, was overlooked. It has since become apparent that the entire disease is seldom removed by eradication of a single focus and that the residual tuberculosis should be treated by a strict medical supervisory program including a minimum period of six months of rest in bed.

Other investigators reported similarly unsatisfactory early experiences, but with the advent of streptomycin in late 1946, enthusiasm for resection in tuberculosis was renewed. Since then it has been observed that the hazards of postoperative infection, spread, and complicating fistulae are greatly reduced with the use of streptomycin alone, and even more so when para-aminosalicylic acid (PAS) and streptomycin are used in combination. Jones[5] convincingly demonstrated that the results of resection in patients in whom the organisms are streptomycin-sensitive are far superior to the results when the bacilli are resistant to the drug. It is, therefore, extremely important that streptomycin not be given indiscriminately lest resistance develop and make the drug ineffective in event it is needed later in connection with resection.

SELECTION OF PATIENTS FOR RESECTION

General considerations before resection should include the age of the patient, the duration of the disease, the status of the bronchial system and the anatomical location of lesions.

Age of the patient. Young persons withstand major operations of any kind much better than older patients, and this is a point of major concern in resection for tuberculosis. Patients more than 60 years of age with cavitary disease are certainly less desirable candidates for resection than are patients 20 to 30 years younger.

Duration of disease. Experience to date indicates that pulmonary resection should not, as a rule, be recommended in the treatment of patients with early primary lesions. Rest in bed and reversible collapse methods such as pneumothorax and pneumoperitoneum should certainly be given adequate trial. On the other hand, a five-year course of these methods without definite progress in cavity collapse would indicate the use of a more radical approach. For this reason close liaison between medical and surgical consultants is of the utmost importance.

Status of the bronchial system. Any patient being considered for resection should have a careful bronchoscopic investigation. Acute ulcerative tuberculous bronchitis of the main bronchial tree makes resection inadvisable. On the other hand, the presence of a stenosing lesion of the bronchus leading to the diseased lung often facilitates the surgical bronchial closure. The status of the bronchial lumen is likewise of importance in determining whether or not pneumonectomy or lobectomy should be done.

Anatomical location of lesions. For many years thoracoplasty has been a relatively effective means of collapse of tuberculous pulmonary cavities. In some situations, however, the removal of rib segments does bring about adequate collapse or, if collapse is ultimately achieved, it is accomplished by multiple procedures entailing pronounced decrease in pulmonary function. Resection should be considered if the lesions are of a kind frequently not amenable to thoracoplasty—giant tension cavities, excavation in the lower lobes, and lesions in the right middle lobe or in the anterior segments of the upper lobes.

TABLE 1.—*Results 15 to 27 months after operation in 26 cases in which either lobectomy or pneumonectomy, with thoracoplasty, was done.*

	No. cases	Sputum negative for tubercle bacilli	Contralateral spread	Empyema	Deaths
Lobectomy with thoracoplasty	17	15	1	....	1*
Pneumonectomy with thoracoplasty	9	8§	....	2†	1‡

*Death occurred first postoperative day due to unattended bronchial plug. †Drainage was carried out and condition abated. §Six patients home and working. ‡Death caused by progressive disease in opposite lung.

TABLE 2.—*Results in 55 cases in which lobectomy or pneumonectomy, with thoracoplasty, was carried out.*

Lobectomy	Pneumonectomy	Sputum negative for bacilli	Deaths
40	15	50	2

In addition to the above general considerations, the more commonly accepted specific indications for the operation should be mentioned. There seems to be little argument that persistence of disease in spite of technically adequate thoracoplasty is sound reason for considering resection. It is also reasonable to assume that in cases in which the lung is destroyed by tuberculosis, measures less radical than total resection are not likely to be effective. When there is active disease in an unexpanded lung, with the threat of empyema ever present, the problem most frequently is solved by thoracotomy, decortication and, occasionally, simultaneous resection.

SURGICAL TECHNIQUES IN RESECTION FOR TUBERCULOSIS

Within the past three years several technical variations in procedures for resection in tuberculosis have been introduced. Most of them have been aimed at conserving pulmonary function, avoiding postoperative infection, and preventing overdistention of the remaining lung tissue following lobectomy. Gebauer[3] and Chamberlain[1, 2] directed attention to the saving of pulmonary reserve. Gebauer has successfully removed stenosed segments of the bronchi and salvaged the rest of the lung. Chamberlain used segmental resection to good advantage in removing the principal lesion in 100 consecutive cases, with a mortality rate of 3 per cent. The extrapleural approach to pulmonary resection as first advocated by Sarot[7] has many supporters who believe that by this means more thorough excision of diseased tissue can be accomplished and the incidence of complicating postoperative infections reduced.

In 1945 Iverson and Skinner[4] described removal of an upper lobe or of an entire lung, with thoracoplasty carried out at the same time to fill the space and thus avert overdistention of the remaining portion of the lung or of the opposite lung. Samson, Dugan, and Harper[6] in 1950 made a preliminary report on results in 26 cases in which the method was used; and since that time 29 additional patients have been treated by this means, making a total of 55 in the series. Results in the first series of 26 cases and the combined series of 55 are given in Tables 1 and 2.

In all 55 cases the fifth rib was removed in opening the chest for resection. Following the resection, ribs four, three and two were removed and the pleura was separated from the undersurface of the first rib, leaving the entire top rib intact. Tube drainage of the pleura was carried out after lobectomy, but in no instance for more than three days.

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Hirschsprung's Disease and Congenital Megacolon

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SUMMARY

Hirschsprung's disease and congenital megacolon are recognized as separate entities. They differ one from another in clinical, roentgenographic and histologic features.

Conservative treatment of patients with Hirschsprung's disease is ineffective; surgical therapy with a new technique is beneficial. In congenital megacolon, operation is futile and may be harmful, whereas patients may be benefited by conservative measures, and improvement may occur spontaneously after adolescence.

SINCE 1886, when Hirschsprung described congenital dilatation and hypertrophy of the colon, there have been numerous theories concerning pathogenesis.[8, 9, 12, 13, 17] It has been generally accepted since 1907 that some kind of neurogenic disorder is responsible. Several methods of treatment have been used, none of them uniformly successful. Up to 1927, patients who did not respond to catharsis, enema, and special diet were subjected to partial or complete colectomy, a procedure which was gradually discarded because of the high mortality and the development of dilation of the bowel proximal to the site of anastomosis.[5, 10, 11, 21, 26] Lumbar sympathectomy, introduced in 1927,[24] also has fallen into disfavor because of debatable clinical results, the apparent destruction of pathways of visceral sensation, and the occasional occurrence of sterility in males.[1, 10, 11, 16, 18, 22] The introduction, in 1938, of parasympathetic paralysant and parasympathomimetic drugs such as Syntropan® and Mecholyl® bromide, considerably aided in the medical management of patients with the disease.[14, 15] The few sporadic reports appearing in the literature since 1920 of cases of Hirschsprung's disease in which there was an absence of Auerbach's myenteric plexus distal to the dilated bowel (the condition was compared to achalasia of the esophagus)[4, 7, 23] received little attention until 1948, when relatively large series of cases were studied and a new surgical procedure was devised.[3, 20, 21, 25, 27] Denny-Brown and Robertson[6] observed in experimental studies, and in patients with destructive lesions of the cord and autonomic nerve supply to the lower bowel, that the act of defecation is an automatic or reflex action mediated by Auerbach's plexus. Adequate stimulus is tension on the wall of the rectum, and possibly the lower sigmoid colon, causing contraction of the rectum and reciprocal relaxation of the sphincter ani. The sympathetic and parasympathetic nerve supplies can both be destroyed without completely inhibiting this mechanism.

For many years it has been recognized that the clinical and roentgenologic features associated with congenital dilatation and hypertrophy of the colon are not the same in all cases and that the response to treatment is not uniform. There is now a tendency to divide the cases into two groups, one designated specifically as Hirschsprung's disease, the other as congenital megacolon.[3] Characteristic of the former, which has been most thoroughly studied recently, are a history of severe constipation from birth, with frequent episodes of abdominal pain, and vomiting. The stools are small, hard pellets. The abdomen is huge, and in many cases waves of peristaltic action and outlines of loops of bowel are visible through the abdominal wall. When rectal examination is carried out, the sphincter is noted to be normal and the ampulla empty. In roentgen studies with barium enema, the rectum and distal sigmoid colon are observed to be normal or narrow and irregular and the proximal sigmoid colon abruptly dilated. Complete absence of Auerbach's plexus in the narrowed portion has been reported observed in histologic examination.[21, 25] Patients with Hirschsprung's disease do not respond well to medical treatment, but may be cured by a new surgical procedure in which the narrowed portion of the sigmoid colon and rectum is resected and the dilated colon anastomosed as near the anus as possible, with preservation of the internal sphincter ani.[2, 19]

The operation was done upon five patients at Children's Hospital, Los Angeles. Four of them were improved.

REPORT OF A CASE

A white girl seven months of age was first admitted in 1944. There had been no bowel movement for six days. History: Delivery was normal. No meconium was passed during the first four days of life. Thereafter the patient was chronically constipated with frequent periods of several days between bowel movements, despite use of laxatives, enemas, and suppositories. Feeding and development were normal. There was one normal older sibling.

The patient was fairly well nourished and developed. The abdomen was distended and a hard mass was palpated in the pelvis. Outlines of intestinal pattern were observed at times. The anal sphincter was normal, and a fecolith, which numerous enemas failed to remove, was felt high in the rectum. At laparotomy the colon was observed to be dilated, there was no constriction, and the fecolith was crushed.

In 1947, the patient was referred to the hospital for sympathectomy, but the operation was not carried out. During the

From the Department of Roentgenology of Children's Hospital, Los Angeles, California.

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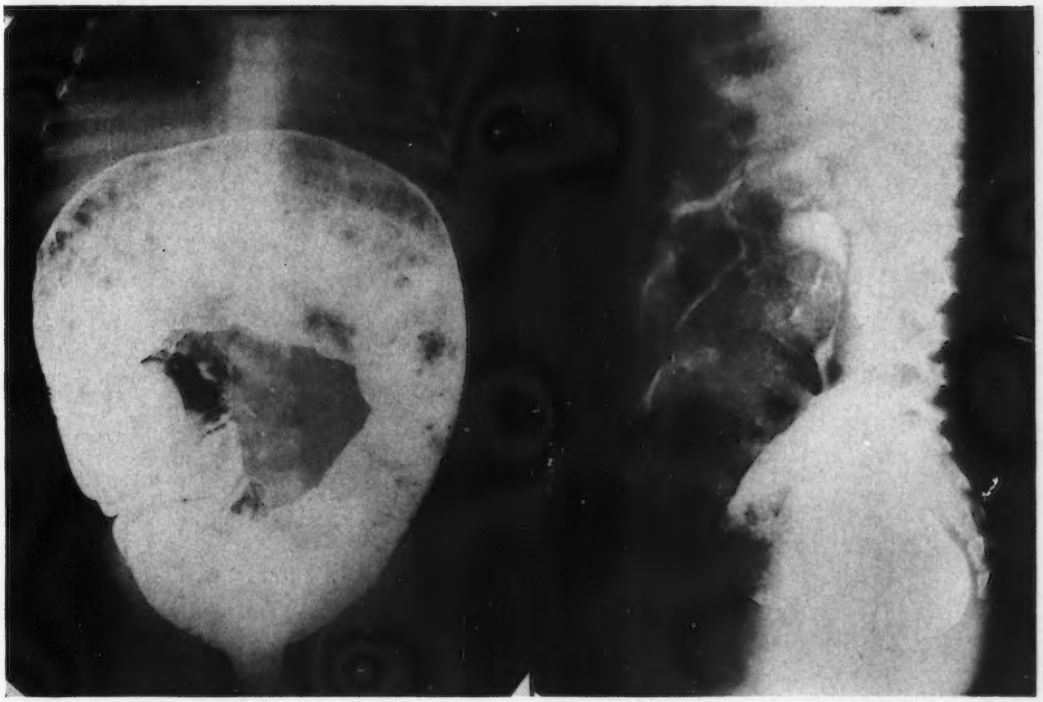

Figure 1.—Case 1: Barium enema before operation. In the posterior-anterior view the redundant sigmoid obscures the narrow rectum and distal sigmoid, which are clearly seen in the lateral view.

three and one-half year interval there had been almost no spontaneous bowel movements, the stools were small and hard, and the abdomen had been constantly enlarged. There were frequent episodes of vomiting. The child, then four years of age, was small and undernourished, with a tremendously distended abdomen. Bowel loops and peristalsis were visible on the abdominal wall. The anal sphincter was normal and the rectal ampulla empty. In roentgen examination with a barium enema the rectum and distal sigmoid colon were observed to be normal and the proximal sigmoid colon abruptly dilated (Figure 1). Very little of the barium suspension was evacuated.

During the next two years the constipation was partially relieved by the use of Mecholyl® and Zymenol.® There were, however, numerous episodes of great distention and vomiting, necessitating hospitalization on one occasion. In July, 1949, proctosigmoidectomy of the Swenson type was performed. No special studies were made of the section of bowel removed. Following the operation there was a slight stricture at the site of anastomosis which necessitated dilatation. Two months later intestinal obstruction caused by adhesions of the small bowel and herniation of several loops of small bowel through the operative site was relieved surgically. A year after the operation there was no constipation, and the abdomen was flat. In a barium enema study (Figure 2) the colon was observed to be only slightly larger than average and it emptied normally.

The case reported is representative of the new concept of Hirschsprung's disease, characterized by a neurogenic obstruction due to agenesis of Auerbach's plexus in the rectosigmoid area, which can be diagnosed clinically and by roentgen examination, and can be cured by a new surgical technique.

CONGENITAL MEGACOLON

In the disease now specifically designated congenital megacolon, the clinical and roentgenologic manifestations differ somewhat from those of Hirschsprung's disease, and the therapeutic approach is different. As in Hirschsprung's disease, there is constipation from birth, but the stool is large in diameter and often hard and blood-streaked. Bowel movements are difficult and painful, and intestinal colic, often precipitated by the administration of purgatives, is frequent. There is moderate abdominal distention, and palpable fecal masses are present in many cases. The rectal sphincter is normal, the anal canal short, and the rectal ampulla full of feces. In roentgenologic examination with barium enema the rectum and the pelvic colon are observed to be dilated and there is a varying amount of enlargement of the rest of the colon. For the most part, patients respond well to medical treatment, and may improve spontaneously after adolescence. The pathogenesis is unknown.

The following is an example of this kind of congenital dilation and hypertrophy of the colon:

CASE REPORT

A six-month-old white male was first observed in 1948 with complaint of recurrent cyanosis, especially noticeable while he was straining at stool. The baby had been blue at birth. Obstinate constipation and a large abdomen had been present since birth. Stools were usually large and hard, necessitating frequent use of laxatives and enemas. There

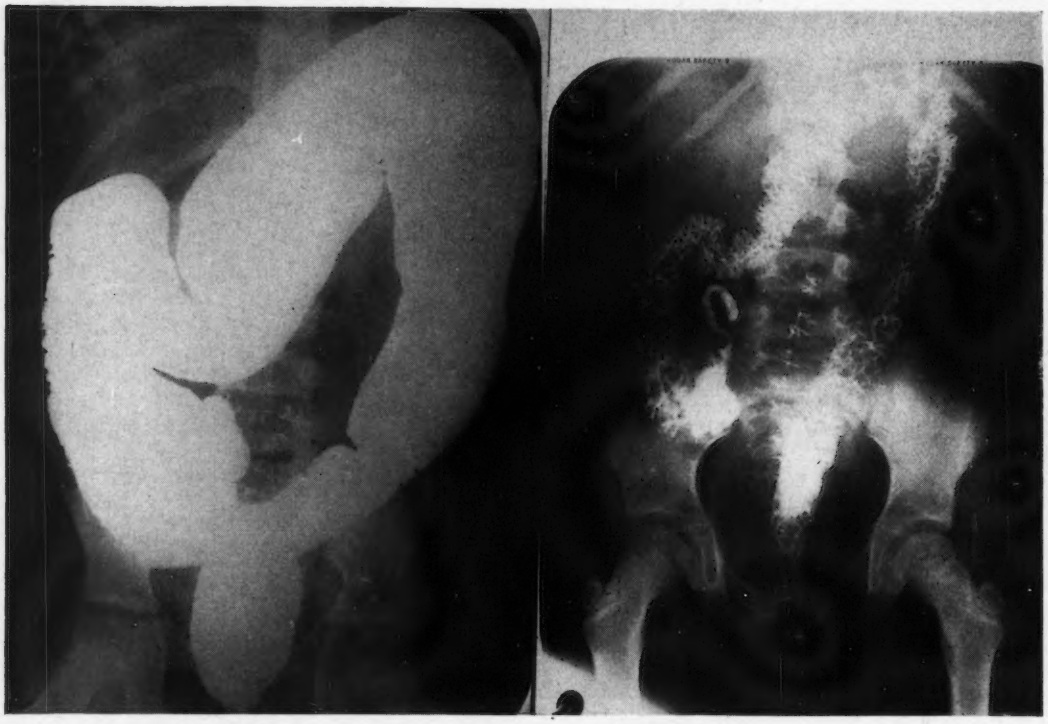

Figure 2.—Case 1: Barium enema one year after operation, showing the almost normal appearance of the colon when filled and the normal evacuation.

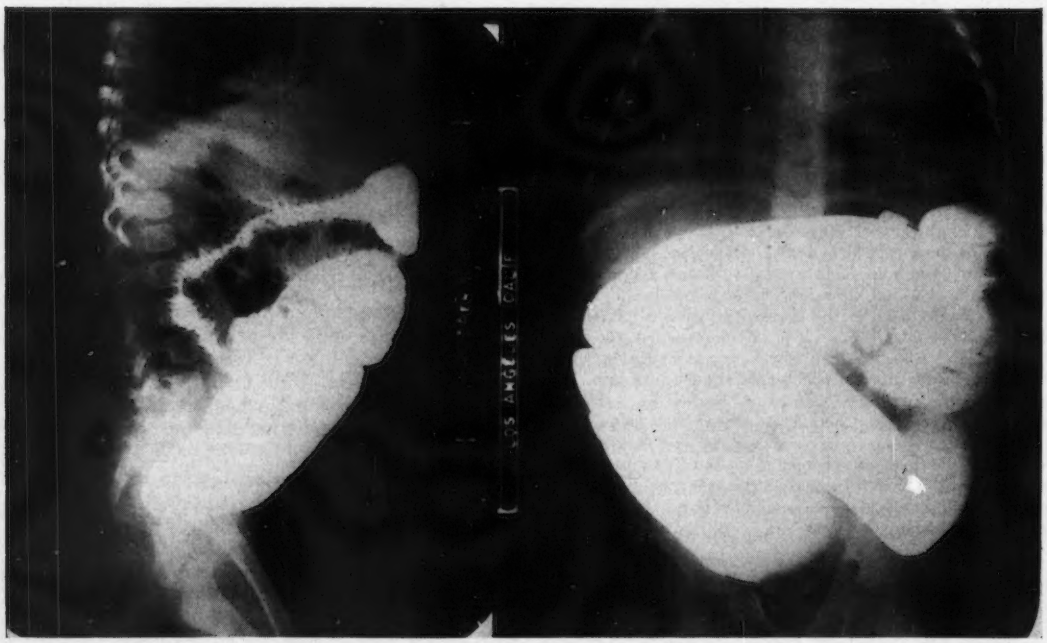

Figure 3.—Case 2: Barium enema before operation, showing the uniform dilatation of the colon in the posterior-anterior view, and the dilatation of the rectum in the lateral view.

were numerous episodes of distention, flatus, and borborygmus. The baby had not nursed well for the first weeks and feeding had remained a mild problem. There were three normal siblings. The baby was well nourished and developed, with moderate pallor. Mild perioral cyanosis was noted, and there was a loud systolic murmur over the precordium. The abdomen, when first examined, was prominent, soft, free of masses, with active peristalsis; but at times there was distention, with the outlines of intestinal pattern visible, and tympany and borborygmus. In roentgenologic examination with barium enema (Figure 3) the colon was observed to be uniformly dilated. The rectum, which was dilated, was funnel-shaped at the anus. Very little of the barium was evacuated.

During the next 18 months constipation was controlled by giving Mecholyl® and Zymenol.® These drugs, however, were not given regularly, and there were numerous episodes of abdominal cramps, distention, and occasionally vomiting, which were relieved by enemas.

Because of persistent albuminuria, renal studies were carried out and bilateral hydronephrosis and hydroureter were diagnosed. A stricture at the left ureteropelvic junction was relieved by pyeloplasty in December 1949.

In February, 1950, when the patient was two years of age, proctosigmoidectomy of the Swenson type and sympathectomy on the right side were performed. No special studies were made of the segment of bowel removed. The response to this treatment was poor. There was recurrent abdominal distention, and no spontaneous bowel movements were obtained after the patient left the hospital. When the tip of an enema tube was inserted into the rectum, however, a semiliquid stool was forcefully ejected.

A month after operation the patient was readmitted because of persistent vomiting and distention. At laparotomy the small bowel appeared to be normal, the cecum and transverse colon were distended, and no mechanical obstruction was found. Cecostomy was performed. Following operation there were several febrile episodes diagnosed as caused by recurrent pyelonephritis.

The patient was admitted again in June, 1950, with a history of vomiting, diarrhea, and abdominal pain of two days' duration and coma for two hours. The abdomen became distended and the patient died within twelve hours. At autopsy it was observed that the entire remaining large bowel was dilated and the muscle layers hypertrophied. In microscopic studies, no abnormalities were noted in the ganglia or nerves in the wall of the bowel in routine sections.

The case reported exemplifies the disease now specifically called congenital megacolon. Although there were complicating congenital lesions of the heart and kidneys, the patient was managed by modern conservative methods. The surgical procedure so beneficial to patients with typical Hirschsprung's disease only complicated the management.

FURTHER CONSIDERATIONS

In addition to these two definite clinical entities, a few cases have been reported in which there was agenesis of Auerbach's plexus in long spans of the colon, and even in the entire colon, causing obstruction.[27] At operation in those cases the involved portion of the bowel was observed to be narrow, with dilation proximally. The patients died in early infancy before the diagnosis was made. No reports on complete roentgenologic studies are available. Figure 4 indicates the segments of dilation and narrowing of the bowel typical of each of the conditions considered in this presentation.

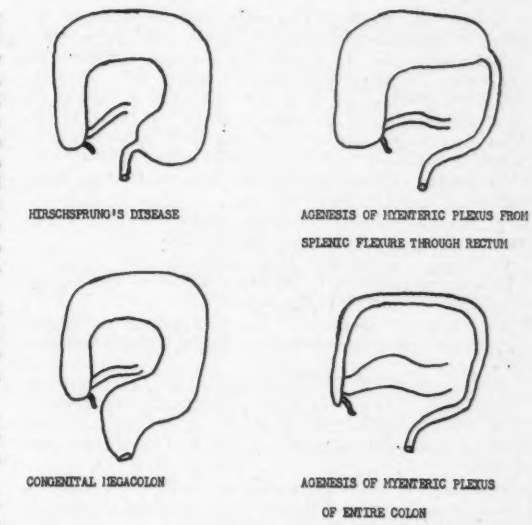

Figure 4.—Diagrams showing the configuration of the colon with various types of neurogenic lesions.

The work on the new concept of Hirschsprung's disease and allied disorders of the colon is not complete. It is apparent that there is a fairly close correlation between the complete absence of Auerbach's plexus and narrowing of the affected segment of bowel such as to make the roentgenographic appearance similar to that of partial mechanical obstruction. In some cases, however, the absence of the myenteric plexus extends for varying distances into the dilated portion. In others, areas of agenesis of the plexus have been found scattered along the colon with normal plexus in intervening segments. In some cases in which conditions otherwise are typical of Hirschsprung's disease, this peculiar distribution of Auerbach's plexus in the colon proximal to the sigmoid has been observed. It remains to be seen whether, under close observation, some of the more unusual and complex types of neurogenic disorders of the colon can be demonstrated by means of roentgen studies with barium enema.

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The Incidence of Splenic Metastasis of Carcinoma

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SUMMARY

The incidence of metastases to the spleen observed at autopsy in a series of 1,000 consecutive cases of malignant neoplasms of epithelial origin was 9 per cent; in a group of 104 cases of malignant neoplasms of non-epithelial origin, the spleen was involved in 45 per cent. These data do not support the contention that metastasis to the spleen is rare, or that the spleen possesses anti-neoplastic properties.

THE spleen has often been cited as an infrequent location of metastatic tumor deposits in man,[9, 12, 15] although some evidence has been presented to the contrary.[11, 13, 16] A large volume of experimental work has been performed in an effort to investigate the "anti-neoplastic" properties of the spleen.[14] It is the purpose of this paper to present additional evidence that the spleen should not be considered a rare site of metastasis.

MATERIAL AND RESULTS

The incidence of metastases to all sites, as observed at autopsy in 1,000 consecutive cases of malignant neoplasms of epithelial origin at the Montefiore Hospital between 1943 and 1947, was recorded. Some of the results of this survey have already been reported.[1, 2] There was metastasis to the spleen in 90 of the 1,000 cases. Table I gives the incidence of carcinoma arising in different sites and the number and percentage of metastases to the spleen from each primary site. Metastases to and direct extension to the capsule of the spleen were excluded as carefully as possible.

During the same period at the same hospital autopsy was done in 104 cases of malignant neoplasm of non-epithelial origin. The incidence of splenic involvement in this group is shown in Table 2. The spleen was involved in 47 cases, most often in association with lymphosarcoma and Hodgkin's disease.

DISCUSSION

Di Biasi[5] reported splenic metastases in 1.86 per cent of 9,761 cases of carcinoma, Gussembauer and Winiwarter[8] in 0.9 per cent of 1,445 cases, and Handley[10] in 0.2 per cent of 422 cases of carcinoma of the breast. Barron and Litman[3] noted splenic enlargement in seven of 1,000 cases of malignant neoplasm, but in only one of the seven was there metastasis of the tumor to the spleen. Ewing[6] considered metastasis to the spleen a rarity. Guttman[9] discussed the common explanations for the "infrequency" of splenic metastases, such as the motility of the spleen, the absence of afferent lymphatic vessels, and the sharp angulation of the splenic artery as it leaves the celiac axis. In 1942, Herbut[12] noted metastases in the spleen in only 2.4 per cent of 640 cases of carcinoma. On the basis of these observations, it would seem that metastasis to the spleen were indeed rare.

Other investigators, however, have reported observations not in accord with the foregoing. Warren and Davis[17] in 1934 noted metastases to the spleen in 4 per cent of 1,140 cases of neoplastic disease. As this was not significantly different from the incidence of renal metastases in their series, they saw no reason to believe that splenic tissue possessed anti-neoplastic properties. Yokohata[18] reported a high incidence of metastases to the spleen in a small group of cases carefully studied. Koletsky[13] observed tumor cells in the spleen in 11 per cent of 100 cases of carcinoma of the lung; Grauer[7] in four of 34 cases (11 per cent) of carcinoma of the pancreas; and Saphir and Parker[16] in 10 of 43 cases (23 per cent) of carcinoma of the breast. More recently Harman and Da Corso[11] noted splenic metastases in 13

TABLE 1.—*Incidence of Metastases to the Spleen in 1,000 Cases of Malignant Neoplasm of Epithelial Origin*

Site of Carcinoma	Number of Cases	Metastases to Spleen	
		Number	Per Cent
Breast	167	28	17
Lung	160	15	9.5
Stomach	119	7	6
Colon	118	6	5
Rectum	87	5	6
Ovary	64	17	27
Kidney	34	2	6
Uterus	23	2	9
Prostate	19	1	....
Bladder	19	1	....
Cervix	13	1	....
Nasopharynx	3	1	....
Fallopian tube	2	2	....
Primary site unknown	26	2	....
Others	146	0	....
Total	1,000	90	

TABLE 2.—*Incidence of Splenic Involvement in 104 Cases of Malignant Neoplasm of Non-Epithelial Origin*

Neoplasm	Number of Cases	Involvement of Spleen	
		Number	Per Cent
Lymphosarcoma	22	18	71
Hodgkin's disease	21	15	82
Reticulum cell sarcoma	16	8	50
Melanosarcoma	7	3	....
Kaposi's sarcoma	5	2	....
Miscellaneous	33	1	....
Total	104	47	

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TABLE 3.—*Incidence of Metastatic Involvement of Various Visceral Organs, Observed at Autopsy in 1,000 Consecutive Cases of Carcinoma*

Site of Metastases	Percentage of Cases With Metastases
Kidney	12.5
Pancreas	11.5
Ovary	11.0
Spleen	9.0
Uterus	6.0
Gallbladder	6.0
Bladder	3.5

per cent of 116 cases of carcinoma; and in a group of 30 cases selected because one or more visceral sites were involved, metastases to the spleen were present in 15.

Although the literature contains conflicting reports on the incidence of metastases to the spleen, in general the more recent reports suggest a higher incidence than the older ones.

Again with regard to the previously mentioned series of 1,000 cases at Montefiore Hospital, the incidence of metastases from neoplasms of epithelial origin to a number of organs is listed in Table 3. There was a higher incidence of metastases to the spleen than to the uterus, the gallbladder or the bladder, and only a slightly higher incidence of metastases to the kidney, to the pancreas or to the ovary than to the spleen. De Long and Coman,[4] in recent experimental work with tumor implants, noted no difference in the incidence of neoplastic growth in the spleen as compared with that in the adrenal glands or the kidneys. Hence, if metastasis to the spleen is considered a rarity, then it is logical to look upon metastases to these other organs as rare also.

The data on incidence of splenic involvement by malignant tumors of non-epithelial origin (Table 2) do not represent the actual incidence of metastases in these cases, since in some instances the tumors may have been primary in the spleen. The high percentage of cases in which there was splenic involvement supplies additional evidence, however, that the spleen is by no means infertile soil for tumor growth, either primary or secondary.

Probably the incidence of metastases to the spleen would be found to be even higher if exhaustive histopathologic studies of splenic tissue were performed in all cases of carcinoma. Furthermore, if the incidence of metastasis per volume of splenic tissue is compared with the incidence for equivalent volumes of lung or liver, splenic metastatis is just as common on a volume for volume basis as is hepatic or pulmonary metastasis. To speak of the spleen as a "rare site" of metastasis is no longer justified.

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Trichophyton Tonsurans (Crateriforme) Infection of the Scalp

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SUMMARY

Of 484 cases of ringworm of the scalp observed in a period of two and a half years at a clinic in Los Angeles, 57 (11.78 per cent) were caused by Trichophyton tonsurans, an organism previously considered an infrequent cause of tinea capitis in the United States. The hairs at the site of infection with this organism are distinctively fluorescent when viewed under a Wood light—glowing white rather than green as do hairs infected with microsporum. Endothrix spore formation may be noted in microscopic examination of infected hairs. Material planted on Sabouraud's media grows as a typical crateriform colony. Occasionally variant growths on cultures are obtained.

Trichophyton tonsurans may cause either dry, scaly lesions or inflammatory reaction. In the present series the incidence of cure was higher and the period of treatment shorter for patients with the inflammatory variety. Various antifungal preparations were employed for topical application and although the results were extremely variable, it was felt that some benefit was derived from their use. For lesions of the dry, non-inflammatory type, roentgen ray epilation appeared to be the treatment of choice.

DURING the past decade throughout the United States considerable attention has been focused on tinea capitis, which in many localities has assumed epidemic proportions. The specific fungus responsible for the "epidemic form" is the Microsporum audouini (human type). Of lesser epidemiologic importance and causing relatively fewer infections is the Microsporum lanosum (animal type). These two species of Microsporum were the agent in the great majority of the cases recently reported. A few of the reports[2, 3, 7] listed a small percentage of the cases as caused by various species of Trichophyton. Because of the few patients available for study, there is little in the American literature about trichophytosis of the scalp, and, more specifically, tinea capitis caused by Trichophyton tonsurans. Therefore, when quite unexpectedly many children with Trichophyton tonsurans infection of the scalp were observed, the opportunity for study of this uncommon variety of tinea capitis was welcomed.

This kind of ringworm of the scalp, which has always been considered a rarity, is now prevalent in the Los Angeles area. Fifty-seven cases were observed at the Southeast Tinea Capitis Clinic of the Los Angeles City Health Department in a period of two and a half years. In the same period, 36 cases were observed at the Health Department's Central Tinea Capitis Clinic.

Trichophyton tonsurans infection of the scalp was first clearly delineated from other forms of ringworm in 1844 by David Gruby.[4b] In 1845 Malmsten[10] described the same condition and suggested the name *Trichophyton tonsurans* for the causative organism. Both Gruby and Malmsten had reported that the infected hairs were filled with spores but it remained for Sabouraud,[13] nearly 50 years later, 1894, to grow the fungus on special media. Sabouraud named the organism *Trichophyton crateriforme*. Priority, however, has been given to *Trichophyton tonsurans*.

This variety of ringworm has been well known in England,[6] France[13] and other European countries,[9] but in the United States has never gained a foothold. Although a survey of recent reports from areas where tinea capitis is rampant indicates the rarity of this kind of infection,[1, 14, 9] with shifting of populations at this time it would appear that conditions are ripe for a country-wide epidemic similar to that which was caused by Microsporum audouini about ten years ago.

CLINICAL MANIFESTATIONS

Although tinea capitis caused by Trichophyton tonsurans can often be recognized from the clinical manifestations, Wood light examination (inspection in a darkened room under filtered ultra-violet rays) is of further help in diagnosis. Even so, definitive diagnosis depends upon mycologic examination.

As in Microsporosis, the disease is characterized by the formation on the scalp of single or multiple baldish scaly patches which may be dry and not inflamed, or inflamed in variable degree. The individual plaques are usually discrete, circular, and from 0.5 to 6.0 cm. in diameter (Figure 1). Occasionally, larger areas are encompassed by the confluence of adjacent small patches. Usually, however, the individual lesion caused by Trichophyton tonsurans is less well outlined and tends to be smaller than that of microsporosis. Early in infection the lesion is similar to the annular lesion characteristic of tinea circinata, with a prominent, sharply marginated raised border. At this stage there is little loss of hair; and it is only in this stage that the term "non-fluorescent ringworm"[8] is applicable, for under

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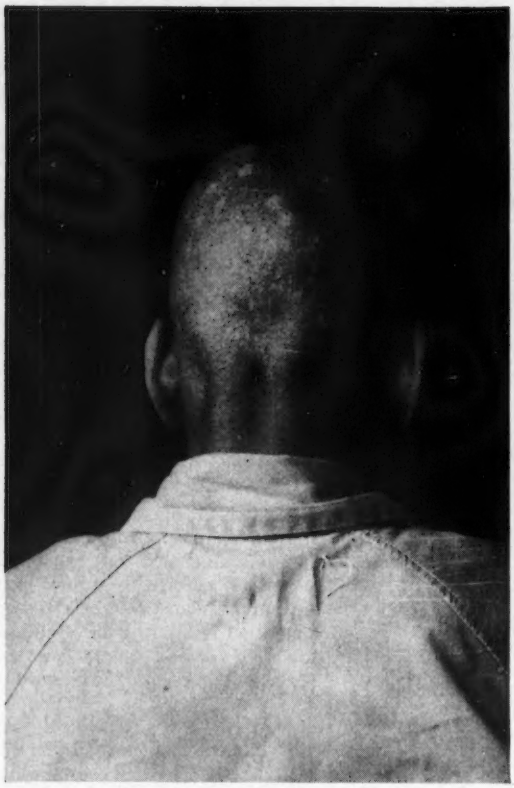

Figure 1.—Multiple small, dry patches of alopecia with slight scaling. Trichophyton tonsurans infection, non-inflammatory.

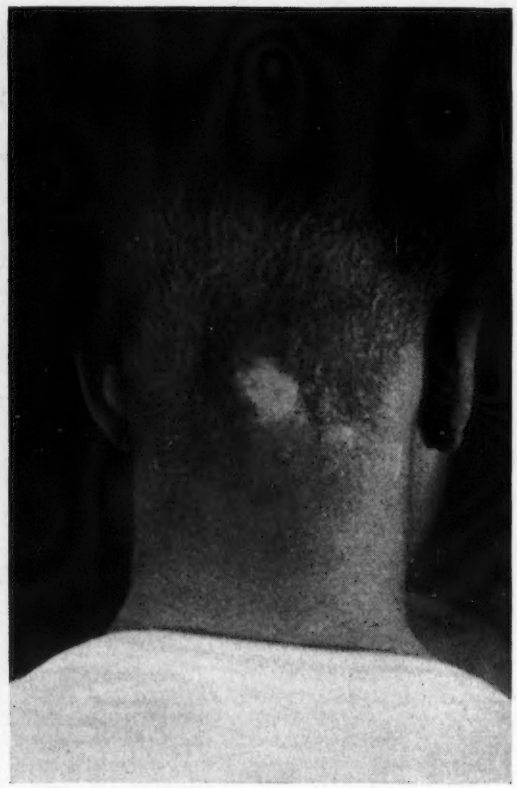

Figure 2.—Residual bald patches of involuted kerion caused by Trichophyton tonsurans.

the Wood light the hairs appear normal.* As the disease progresses, the infected hairs break off at the surface of the scalp, although characteristically a number of longer, normal-looking hairs remain in the otherwise bald patch. A grayish-white thin scale covers the surface. Upon examination under magnification, some short, thickened hair stubs projecting 2 to 3 mm. above the surface, and many minute keratotic follicular papules may be noted. Within each papule is an incarcerated twisted hair.

Inflammatory reactions are common. They vary in degree from slight edema and erythema with oozing and crusting to deep, draining abscesses and phlegmons (kerion). Frequently a few inflamed follicular papules or pustules are present in an otherwise dry and non-inflammatory patch. Extension of the inflammatory process may involve other follicles in the patch, and thus progression through stages of development from superficial perifollicular reaction to the production of true kerion may occur. As a consequence of inflammation, smooth, shiny atrophic depressed plaques bearing a close resemblance to the lesions of alopecia areata result (Figure 2). Regrowth of hair, however, usually takes place, although some scarring and partial alopecia may result. No patient in the present series had permanent complete alopecia.

* The term "non-fluorescent ringworm," as applied to Trichophyton tonsurans infection of the scalp to differentiate it from Microsporum infections, is actually a misnomer. The infected hair stubs and plugs in the former give off a white fluorescence in contrast to the brilliant green of the infected hairs of the latter.

WOOD LIGHT EXAMINATION

The appearance of the infected scalp under filtered ultra-violet rays is quite distinctive and, in the authors' experience, usually diagnostic. Whereas in microsporosis the infected hairs emit a brilliant green fluorescence, in Trichophyton tonsurans infections each involved follicle is identified by a dull to gleaming white scaly plug filling the orifice. Removal of the plug exposes an attached and imbedded short hair. If the hair has escaped incarceration in the mass of keratin, it projects through the follicular plug as a thickened white stub. When the plug or protruding hair is extracted, the intrafollicular portion can be faintly visualized but it does not fluoresce. Fluorescence is due to the keratin scale which fills the follicular orifice and which also extends as a sheath along the extrafollicular portion of the hair. Frequently, extensive involvement is noted under the Wood light in cases in which clinical inspection indicated only a few areas of infection. Very small spots involving only a few follicles can readily be identified under the Wood light.

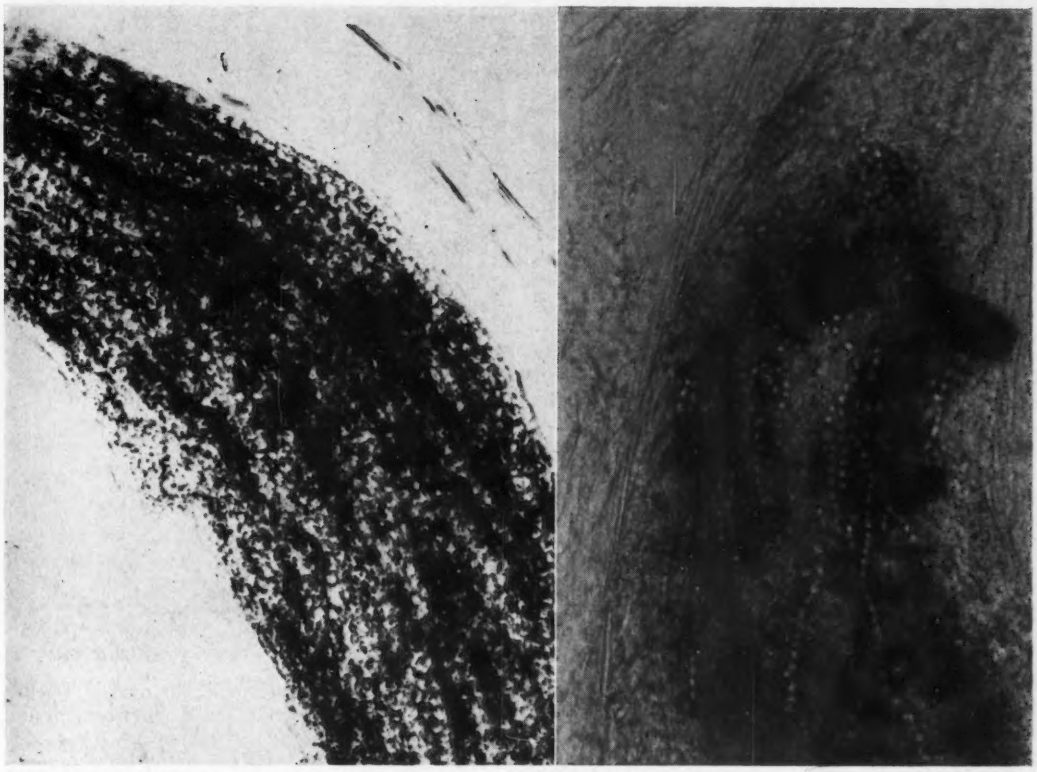

Figure 3.—Left—Endothrix spore formation. Spores are packed within the hair. Right—Arthrospores in long chains within the hair.

MYCOLOGIC CHARACTERISTICS

If a microsporic hair, after suitable preparation in sodium hydroxide solution, is viewed under a microscope, ectothrix spore formation characteristic for microsporosis may be observed — oval or round refractile bodies, 2 to 4 micra in diameter, densely packed, forming a sheath which encloses the hair from just above the bulb to varying distances on the broken shaft. This sheath corresponds to the fluorescent green area seen under the Wood light.

In Trichophyton tonsurans infection, the interior substance of the diseased hair is filled with a mass of spores united in chains, running parallel to the long axis of the hair (Figure 3). The spores are larger, 4 to 6 micra in diameter, and tend to be quadrangular in form. Where the hair has been unable to penetrate through the follicular plug, it lies embedded in a mass of keratin, assuming a twisted, spiral *S* or *Z* shape (Figure 4). Those hairs which project beyond the follicular opening are covered in the extrafollicular portion by a keratin sheath. Spores are not present in the sheath except when the cortex of the hair breaks and spores spill out from the interior. In very early infection, before any appreciable scale develops, the involved hairs appear normal and are not fluorescent, even though they are filled with spores.

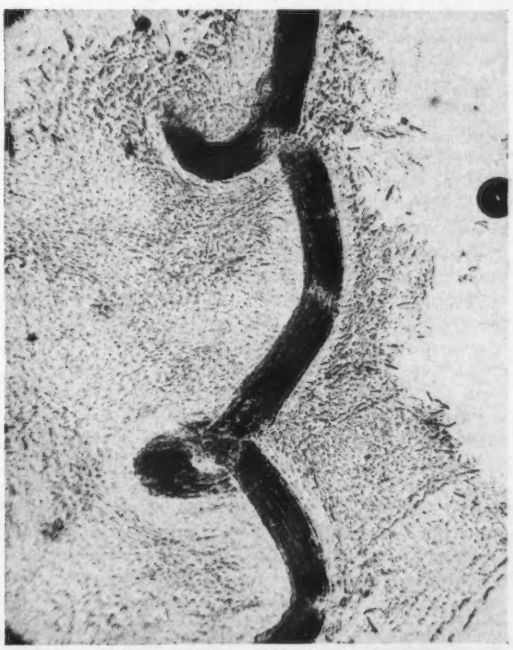

Figure 4.—Twisted degenerating hair imbedded in follicular scale. Spores spill out where the hair breaks.

CULTURAL ASPECTS

On Sabouraud's glucose agar media, growth of Trichophyton tonsurans begins as a white fluffy patch which extends peripherally. Later the colony becomes more compact and develops into a flat, velvety, cream-colored disk. The center of the patch sinks and the edges become elevated, thus forming the characteristic crater from which derives the term *crateriforme.** Frequently a small knob appears at the bottom of the crater. Surrounding the walls is a white mycelial fringe growing out into the media. The surface of the colony takes on a deepening cream to beige powdery appearance as it ages. The gross morphologic characteristics are distinctive; typical colonies, as described, are readily identified (Figure 5). Early in the investigations in the present study, however, it was noted that some of the growths obtained differed considerably from the typical crateriform colonies. In some instances there was so much variation from the typical in color, folding and crater formation that it was felt the organisms were of other species. In microscopic features, these aberrant cultures were similar to each other and to typical cultures of Trichophyton tonsurans. Attempts to identify these variant cultures with the specific organisms described in the various texts and references under such names as T. acuminatum, T. cerebriforme, T. sulfureum, etc., were fruitless. The descriptions given by various authorities were found to be vague and inadequate and frequently in conflict. Letters and cultures were dispatched to a number of leading mycologists in this country for aid in this problem. In every instance the replies indicated that the same difficulty in identification existed in other quarters.[12] The consensus of many American mycologists at present seems to be that the members of the crateriform group cannot be identified accurately as to species, and in general must be considered as strains of Trichophyton tonsurans.

DIFFERENTIAL DIAGNOSIS

Differentiation of Trichophyton tonsurans infection of the scalp from other conditions which resemble it should not be difficult if the Wood light procedure, the microscopic examination of the hair, and the culture method are utilized. The common microsporum infections are readily identified by the green-fluorescent hairs, the ectothrix nature of the spores on the infected hair, and specifically by the characteristic colonies on culture.

In children, the crusted lesions of impetigo of the scalp may simulate inflammatory Trichophyton tonsurans infection, but the thick crust and oozing base, the absence of white plugs under the Wood light, and laboratory confirmation of fungous disease should decide the issue. Typical impetiginous lesions are frequently also found on the face or ears and there is usually quick response to various germicidal and antibiotic preparations. However, impetigo may lead to temporary alopecia much like that which occurs in involuted inflammatory Trichophyton tonsurans infection (bald ringworm of the English), and unless active lesions are present, it may be impossible to arrive at a definitive diagnosis. Similarly, the plaques of "bald ringworm" often bear a close resemblance to alopecia areata, although the latter condition is not preceded by inflammation.

Other diseases of the scalp that are characterized by scaling patches, such as seborrheic dermatitis or psoriasis, ordinarily do not cause loss of hair.

The authors have observed a few patients with trichotillomania and trichokryptomania who had bald spots on the scalp similar to those caused by Trichophyton tonsurans infections. However, in those instances there was no evidence of scaling or inflammation, and the patients, when questioned, readily admitted the cause.

As the severe inflammatory reaction (kerion) may be mistaken for a carbuncle, it is well to examine hairs at the site of such a lesion under a Wood light lest incision be made unnecessarily.

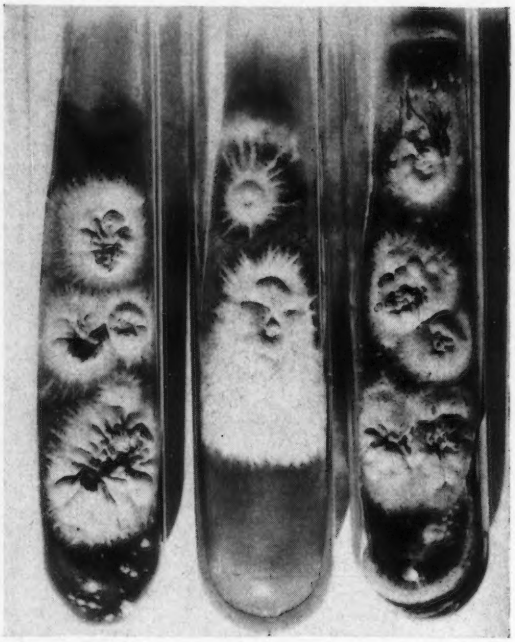

Fig. 5.—Crateriform colonies of Trichophyton tonsurans.

CLINICAL MATERIAL

During the two and one-half year period from July 1947 to January 1950 the diagnosis of tinea capitis, based on the cultural isolation of a specific pathogenic fungus, was made in 484 cases. The relative frequency of infection with various organisms is shown in Table 1. In 57 cases the organism was Trichophyton tonsurans. The patients were from 4 to 15 years of age. Fifty were boys, seven girls. All were Negroes, but no particular significance can be attached to this inasmuch as the vast majority of the patients observed at the clinic are of that race.

* The crateriforme group includes the following four species: Trichophyton tonsurans (T. crateriforme); T. epilans (T. cerebriforme); T. Sabouraudi (T. acuminatum); and T. sulfureum.

TABLE 1.—*Incidence of various organisms in 484 cases of tinea capitis.*

Organism	No. of cases	Per cent
Microsporum audouini	339	70.04
Microsporum lanosum	86	17.77
Microsporum fulvum	2	.41
Trichophyton tonsurans	57	11.78
Total	484	100.00

From a prognostic viewpoint, classification of the disease into inflammatory and non-inflammatory types was advantageous. Twenty-seven children (47 per cent) had lesions of the dry, scaly, non-inflammatory type. The inflammatory type was further divided into the superficial variety and kerion. The superficial variety was characterized by follicular papules and pustules, edema, oozing, and crusting. This kind of reaction frequently subsided with or without treatment. It was observed many times, however that slightly inflamed areas were converted into kerion by treatment with various antifungal ointments or by home treatment with iodine or other irritant preparations. In other cases, kerion apparently arose spontaneously. Kerion occurred in 17 patients (30 per cent), the superficial inflammatory variety of the disease in 13 (23 per cent). Thus, in the majority of the patients (53 per cent) some degree of inflammatory reaction was present. Of the 57 patients, 49 were sufficiently cooperative to permit of some evaluation of the course of the disease and response to therapy. Each of the 49 patients was observed at the clinic for a period of at least two months and the majority for a much longer time.

TREATMENT AND RESULTS

Treatment consisted of daily applications, at home, of various antifungal preparations including salicylanilide ointment, Sopronol® ointment, sulphur ointment and a few newly developed antifungal preparations furnished by pharmaceutical firms for evaluation. Directions were given to shampoo the child's head every evening and then to rub the medication vigorously into each patch. The antifungal preparation was also applied once or twice during the day. Clipping or shaving of the hair from the scalp was requested at intervals of one to two weeks. This was extremely important from the standpoint of determination of cure, for with regrowth of hair it became increasingly more difficult to visualize the white plugs and short hairs of the infected areas. Single or small groups of infected follicles may very readily be overlooked and serve as a nidus for reinfection. Moreover, follicular accumulations due to grease, soap, medicament, or keratin, may be mistaken for infected hair follicles in examination with a Wood light. For this reason, careful shampooing and rinsing of the hair before each visit to the clinic was insisted upon. Results with detergent shampoos were better than those obtained with soaps. A declaration of cure was made with reservation and only after repeated Wood light examinations and mycologic studies of any suspect follicular material. Determination of cure in Trichophyton tonsurans infection is much more difficult than is the case with Microsporum infection. In Wood light examination the white plugs and short white hairs which characterize Trichophyton tonsurans ringworm are not as easily identified as are the brilliant green hairs of microsporosis.

Results in 49 cases in which the patients were under treatment for at least two months are shown in Table 2. There was no untreated control group.

As it was not known how well directions for treatment at home were followed, and as there were other variable factors, the response to various medications could not be satisfactorily evaluated. However, certain impressions were gathered, and it was possible to derive some information of a general nature. The presence of inflammation is a good prognostic sign: The deeper the reaction, the better the result. Significance can be attached to the observation that the incidence of cure was much higher in those patients who had inflammation than in those who had lesions of the dry, non-inflamed type. Twelve patients with kerion were free of infection after an average treatment period of 5.7 months, whereas for the ten patients with lesions of the dry type who were cured, the average treatment period was 11.6 months. It was noted that the dry, non-inflammatory type of infection was usually resistant to all forms of local therapy. A number of patients with this variety of the disease still had infection two years after treatment was started. Whether this infection tends to spontaneous cure at puberty, as does tinea capitis due to Microsporum audouini, cannot definitely be answered at this time. There were no adults in the series. However, at dermatological meetings in Los Angeles a number of cases of adults with tinea capitis caused by Trichophyton tonsurans have been presented. It is the authors' impression that many of the children with infection of the resistant type may carry the disease into adult life unless inflammatory reaction develops. Continued observation of the uncured members of this group may confirm or alter this impression.

Roentgen ray epilation was used in a few of the patients with successful results. This undoubtedly is the treatment of choice for the non-inflammatory resistant variety of the disease.

Treatment of kerion consisted of application of hot magnesium sulphate compresses and 5 per cent ammoniated mercury ointment. This usually checked the severe inflammatory process. In some cases of multiple kerion, procaine penicillin was given parenterally with prompt response.

4418 Vineland.

TABLE 2.—*Results of Treatment*

Kind of lesion	No. Patients	Cured	Not Cured	Average Period of treatment (months)	Range of Period of treatment (months)
Dry	23	10	13	11.6	4 to 22
Inflammatory:					
Superficial	10	5	5	5.4	4 to 8
Kerion	16	12	4	5.7	3 to 12

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The Medical Care Dollar

Americans spent $8,500,000,000 on medical care in 1950. . . . Bureau of Economic Research of A.M.A. analyzes U.S. Commerce Dept. study . . . this is 4.4 per cent of total spent for all consumers' goods and services . . . physicians received $2.4 billion, hospitals $2.0 billion, drugs and sundries $1.4 billion, dentistry $1.0 billion and other medical care $1.7 billion . . . from 1930 to 1950, physicians' share of medical care dollars fell 12 per cent . . . hospitals' share increased 66 per cent, dentists' dropped 26 per cent, drugs' declined 12 per cent and "others" rose 5 per cent.

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Carcinoma of the Ampulla of Vater

Whipple Operation and Ten-Year Arrest in Three Cases

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SUMMARY

For their value as factors in the evaluation of pancreatoduodenectomy for carcinoma of the ampulla of Vater, the late results in three cases in which the Whipple operation was performed for this lesion are presented. At the time of the report, the time that had elapsed since operation was 12 years in one case, 11 in another and 10 in the third. After this article was written, one patient died of carcinoma of the body of the pancreas, but whether the lesion was a recurrence, a metastatic growth, or a second primary lesion could not be determined. There was no evidence of recurrence or metastasis in two of the patients. This report is based upon observation in recent surgical care of two of the patients and upon direct information of the other patient.

SEVENTEEN years have elapsed since Whipple, Parsons and Mullins[6] presented their original radical procedure of two-stage pancreatoduodenectomy in the sugical treatment of carcinoma of the ampulla of Vater. Until then the accepted operation for malignant lesions of the ampulla and the papilla of Vater was transduodenal excision of the tumor, and complete surgical eradication of the lesion was rarely accomplished. In the intervening years many modifications in the surgical technique of pancreatoduodenectomy have been reported, but the procedure in general has become known throughout the surgical world as the Whipple operation. Also, as the technique of the procedure has become standardized, surgeons have adapted the operation to malignant lesions of the head of the pancreas, the common duct, the stomach and duodenum and other lesions in the area, some of which are benign in character.[2, 4, 5] It would seem that the technique of the procedure has become more standardized than have the indications for the operation, and it is only through adequate follow-up in individual cases that the operation can eventually be evaluated in its application to a specific disease. The purpose of this paper is to report the late result in three patients upon whom Whipple operations were performed, by the late Dr. Verne C. Hunt, for carcinoma of the ampulla of Vater. One of the operations was done 12 years, one 11 years, and one more than 10 years ago.

Dr. Hunt and the author, during their association, operated upon five patients who had carcinoma of the ampulla of Vater. The surgical procedures consisted of transduodenal cautery excision of the ampulla of Vater, with reimplantation of the common duct and the duct of Wirsung into the duodenum in two cases, and one-stage Whipple procedure in three cases. In 1941 Hunt[4] reported the results of the two transduodenal cautery excision procedures and two of the Whipple procedures. At that time the results were as follows:

Of the two patients upon whom transduodenal excision of the ampulla had been done, one died 25 months after the operation of extensive metastases to the mediastinum. The other was alive, but with metastases, 34 months after the operation. (This patient died four years after the operation of generalized abdominal metastases.) Both the patients in whom the Whipple procedure was carried out were alive and well at the time of Dr. Hunt's report. Subsequently Dr. Hunt and the author employed the Whipple procedure in another case which was not reported. Two of the three patients recently were again under the author's surgical care, and direct information concerning the other is available to him.

CASE REPORTS

The cases are numbered 3, 4 and 5 in order that cases 3 and 4 may be numbered as they were in Dr. Hunt's original report.

CASE 3 (Abstracted from Dr. Hunt's report): A woman 60 years of age, first observed March 13, 1940, had progressive, painless jaundice of four months' duration, with loss of 50 pounds in body weight. There was no history suggestive of biliary colic at any time. The patient was emaciated and there was intense jaundice. Areas of excoriation and multiple pustules over the entire body were noted. The liver was enlarged to the level of the umbilicus and the distended gallbladder was palpable. There was complete uterine prolapsus and edema of the lower extremities to the knees. The diagnosis was carcinoma of the head of the pancreas or common duct. At operation the gallbladder was observed to be distended and the common duct was dilated. When the common duct was explored a tumor 2 cm. in diameter was palpated in the ampulla. The duodenum was incised and the tumor was visualized.

Procedure. One stage Whipple operation: Resection of the duodenum and the head of the pancreas; ligation and division of the common duct; division and ligation of the duct of Wirsung; cholecystogastrostomy, posterior gastroenterostomy and choledochostomy.

The pathologic diagnosis was adenocarcinoma, Grade II, of the ampulla of Vater, with invasion of the pancreas. (Figure 1.)

Material drained postoperatively had the characteristics of pancreatic secretion and later contained bile. A catheter

From the Surgical Service, St. Vincent's Hospital, Los Angeles.

Presented before the Section on General Surgery at the 80th Annual Session of the California Medical Association, Los Angeles, May 13 to 16, 1951.

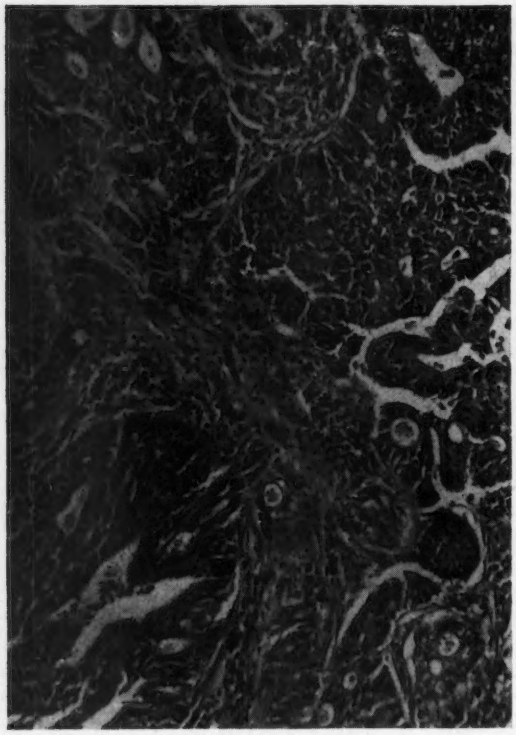

Figure 1.—Photomicrograph of tumor, Case 3.

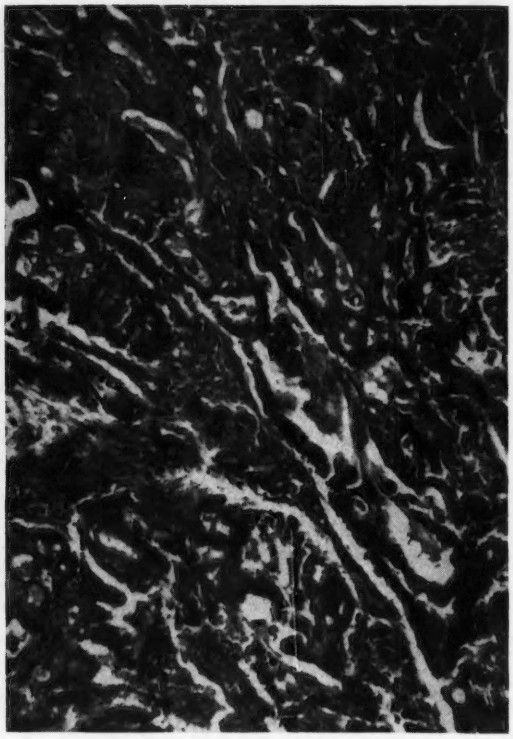

Figure 2.—Photomicrograph of tumor, Case 4.

was inserted into the sinus and continuous suction was maintained. After 27 days the sinus was packed with gauze, drainage ceased and the sinus healed in a few days. The patient was dismissed from the hospital 48 days after the operation.

Follow-up: After the death of Dr. Hunt in 1943, the patient had no medical care throughout the remainder of the war years. When examined in July, 1947, the patient weighed 175 pounds and the chief complaints were related to obesity and uterine prolapsus. Appetite and bowel habits were normal. There was no evidence of recurrence or metastases.

Observed again in July, 1950, the patient, then 71 years of age, had difficulty in voiding because of prolapsus, and there was intermittent bleeding from the uterus. There were no digestive complaints and no evidence of recurrence or metastases. The weight was still 175 pounds.

Vaginal hysterectomy was carried out. The postoperative course was very satisfactory and the patient was dismissed from the hospital on the eighth postoperative day. When last observed she was entirely well.

* * *

CASE 4 (Abstracted from Dr. Hunt's report): A woman 43 years of age was admitted to hospital January 29, 1941, because of anorexia, nausea and pain radiating into the back for three months, jaundice for one month, and a loss of thirteen pounds in body weight.

Neither the liver nor the gallbladder was palpable. Secondary anemia was noted in laboratory studies, and calcification of the gallbladder was observed roentgenographically.

The preoperative diagnosis was calculous disease of the gallbladder and of the common duct. At operation, the gallbladder was observed to be thick-walled and it was contracted on a single large stone. The common duct was greatly dilated.

Operation included cholecystectomy, exploratory choledochotomy, and T-tube drainage of the common duct.

When the T-tube was clamped, profuse bile drainage developed. In a cholangiogram, complete block of the common duct was observed. In exploratory duodenotomy six weeks later an ampullary tumor which seemed to involve the posterior wall of the duodenum and the head of the pancreas was observed. Total duodenectomy and cautery excision of part of the head of the pancreas, pancreato-jejunostomy, choledochojejunostomy and posterior gastroenterostomy were carried out. (The open end of the jejunum was drawn up and sutured over the severed head of the pancreas.)

The pathologic diagnosis was adenocarcinoma of the papilla of Vater, Grade III, with involvement of the duodenum and extension to the head of the pancreas and adjacent lymph nodes. (Figure 2.)

The postoperative course was entirely satisfactory. There was drainage of bile but not of pancreatic secretion. The patient was dismissed from the hospital on the 24th day.

Follow-up: The patient remained well until June, 1949, when acute obstruction of the small intestine developed. At operation[1] the obstruction was observed to be caused by primary carcinoma of the ileum, and resection with end-to-end anastomosis was done. Thereafter the patient had vague distress in the right upper quadrant of the abdomen, but at the time of this report there was no evidence of recurrence or metastasis of either of the primary tumors.

(After this article was submitted for publication, the patient in Case 4 was operated upon elsewhere for recurrent obstruction of the small bowel. At operation a mass,

described as the size of a large lemon, was observed in the body of the pancreas. A specimen of the mass was excised and the pathologic report was mucoid adenocarcinoma. The pathologist made the following comment: "While the tumor is not histologically identical with the structures of the previous known primaries in the ampulla and in the jejunum, it is compatible with recurrence or metastasis of these tumors. Likewise, it may represent a separate primary carcinoma of the pancreas, since primary carcinoma of the pancreas may produce this morphology." As the patient was not in satisfactory condition for pancreatectomy, the incision was closed. When reoperation was carried out several months later, the tumor was deemed inoperable. It had grown considerably in size and had encircled the aorta and the portal vein. The patient died August 1, 1951. It was never possible to determine whether this tumor was a recurrence or a metastasis of the original tumor or whether it was another primary carcinoma of the body of the pancreas.)

* * *

CASE 5 (not previously reported): A man 55 years of age was observed July 29, 1941, because of jaundice following cholecystectomy and common duct drainage which had been done elsewhere in September, 1940. The patient had returned to the surgeon in November, 1940, because of chills, fever and jaundice. The common duct then was explored. No stones were found and an anastomosis was made between the common duct and the pylorus. A biliary fistula developed, and material drained from it intermittently. The jaundice cleared for about three months, but with the intermittent cessation of drainage from the fistula, the jaundice deepened progressively, chills and fever occurred and the body weight decreased 35 pounds.

When examined, the patient was deeply jaundiced and the body weight was 140 pounds, but the general condition was fair despite the long illness, probably because of the intermittent drainage of bile. There was a sinus, which was not draining, in the right upper quadrant of the abdomen. The liver was palpable 4 cm. below the costal margin.

The preoperative diagnosis was stricture of the common duct, and at operation stricture of the distal half of the common duct was observed, with dilation of the common duct and of the hepatic ducts above the stricture. The common duct was reconstructed over a rubber tube.

Recovery was satisfactory. There was no external biliary drainage. The patient was dismissed from the hospital on the 19th postoperative day.

On November 3, 1941, chills, fever and progressive jaundice developed. In an x-ray film of the abdomen, it was noted that the tube, which had been placed in the common duct, had passed. Jaundice seemed to fluctuate somewhat in intensity, but the chills and fever continued. The patient was operated upon again and the common duct was re-explored, exploratory duodenotomy was carried out and a tumor of the ampulla was observed. Duodenectomy, cautery resection of the head of the pancreas, pancreatojejunostomy, choledochojejunostomy over a rubber tube splint and posterior gastroenterostomy were done. (The open end of the jejunum was sutured over the severed end of the pancreas.)

The pathologic diagnosis was papillary adenocarcinoma, Grade I, of the major duodenal papilla. (Figure 3.)

Postoperative drainage of fluid which had the characteristics of pancreatic secretion developed. This was managed by suction and as much as 2,000 cc. of fluid was withdrawn in 24 hours. However, the amount had decreased considerably at the end of two weeks and drainage ceased entirely in four weeks. The patient was dismissed from the hospital on the 18th postoperative day.

The patient remained well until he was hospitalized May 25, 1942, for meningitis. There was a heavy growth of pneumococci, type 29 (Newfeld) on cultures of spinal fluid. Sulfadiazine and sodium sulfadiazine were given and the patient recovered. He was not observed again until December, 1945, and then because of intermittent attacks of chills and fever, pain in the right upper quadrant of the abdomen, and jaundice. There were no palpable abdominal masses and in an x-ray film of the abdomen the rubber tube, which had been placed in the common duct, was observed to be still present. It was advised that the tube be removed surgically because of the probability that jaundice and cholangitis were caused by obstruction of the tube by bile sediment and stony material. Operation was refused and the patient was not observed again until September 6, 1950. In recent months jaundice had been constant, chills and fever frequent and pain and ache in the right upper quadrant of the abdomen increasingly severe. Body weight had decreased 45 pounds and the patient was emaciated and completely incapacitated.

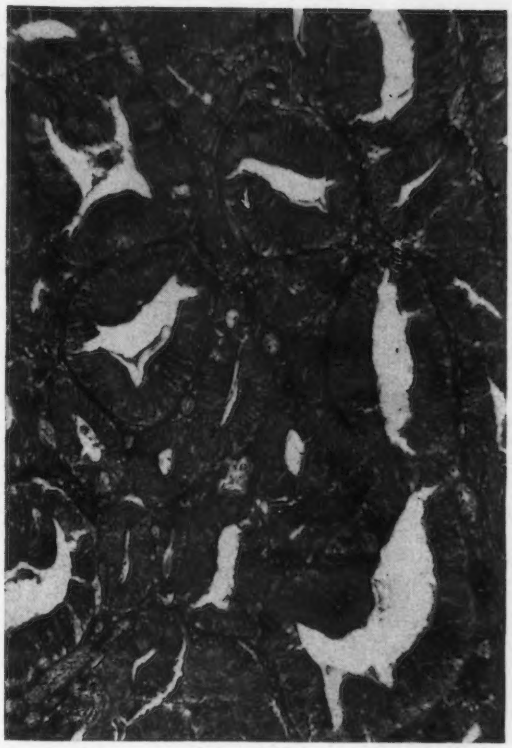

Figure 3.—Photomicrograph of tumor, Case 5.

The jaundice was of bronzing type. The liver was hard and tender and could be outlined well below the costal margin. There were no abdominal masses or nodules and no ascites. There was pronounced secondary anemia. The urine contained 2-plus albumin, and bile. In other laboratory data there was evidence of extensive liver damage. The rubber tube was roentgenographically observed to be still present in the right upper abdomen, and there were four shadows of what appeared to be calculi arranged transversely to the left of the tube at the level of the second lumbar vertebra. (Figure 4.)

The preoperative diagnosis was: (1) obstructive jaundice caused by obstruction of the rubber tube by bile sediment and stony material, (2) extensive liver damage and (3) pancreatic calculi.

At operation, dense adhesions involving the colon, the liver, the closed end of the stomach and the old choledocho-

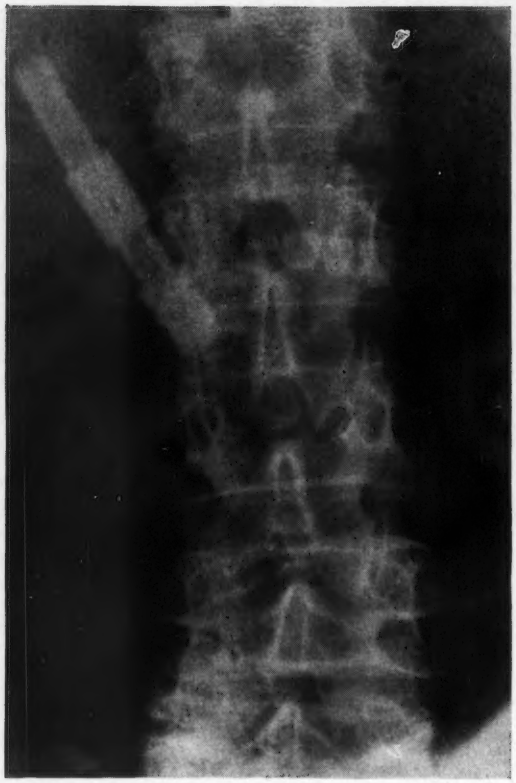

Figure 4.—Retained rubber tube in common duct (Case 5) and pancreatic calculi.

jejunostomy were observed. The liver was enlarged and firm and had the appearance typical of biliary cirrhosis. When the jejunum was exposed the common duct was observed to be dilated and the rubber tube was readily palpable because it was encased in a hard mass of stony material fully four cm. in diameter within the scarred common duct. The distal end of the rubber tube was buried in jejunal mucosa with a minute biliary fistula evidenced by a trickle of bile along the side of the tube. The tube was entirely filled with stony material. The stones in the pancreatic duct were palpable. In exploration of the abdomen, no evidence of tumor was noted.

Jejunotomy, removal of the rubber tube, choledocholithotomy, pancreolithotomy and T-tube drainage of the common duct through jejunostomy were carried out. The jejunum was incised longitudinally distal to the choledochojejunostomy, the rubber tube was exposed at the end and extracted from the common duct and, by means of scoops, 15 grams of stony material was removed from the duct. Irrigation of the duct was productive of more material which was not weighed. A sinus tract into the head of the pancreas was probed and dilated and the four stones were removed from the duct. (Figure 5.) T-tube drainage of the common duct was established by inserting the tube into the jejunum and passing the proximal end of the T well into the common duct. The jejunum was sutured about the long arm of the T, and the tube was brought out through a stab incision.

Postoperatively there was scant flow of watery green bile with offensive odor, and the jaundice increased for the first week. It appeared that the liver was damaged beyond adequate function. However, at the end of the first week the daily output of bile began to increase and the jaundice became static. The patient was dismissed from the hospital to a rest home on the eleventh postoperative day. Jaundice fluctuated and recovery was very slow. Irrigation of the T-tube was productive of gravel from time to time, and the character of the bile remained watery and at times purulent. At the end of two months the jaundice had cleared and the patient had gained ten pounds. Eight months after the operation, recovery still was not complete. There was a gain of 25 pounds in body weight, there was no jaundice, chills or fever, the T-tube was clamped most of the time but irrigation of the tube from time to time still was productive of some bile gravel, and the patient occasionally had colic.

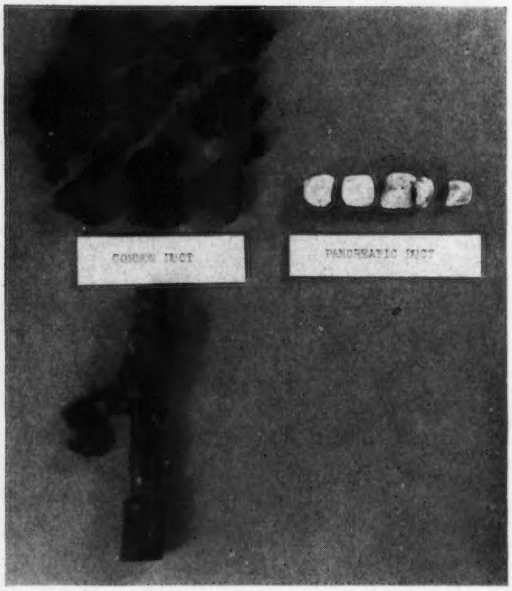

Figure 5.—Photograph of retained common duct splint and common duct and pancreatic calculi removed eight years after Whipple operation (Case 5).

DISCUSSION

The original slides of the tumors in the cases reported were reviewed with Dr. James E. Kahler, pathologist, St. Vincent's Hospital, Los Angeles, and with Dr. John W. Budd, pathologist, Los Angeles Tumor Institute, and they concurred in the original diagnoses. While tumors of this type have been called carcinoma of the ampulla, it has been pointed out by others and it is evident from study of the lesions in Cases 3 and 4 that it is often impossible to determine the origin. The tumors in Cases 3 and 4 were almost identical in that they involved the papilla, the ampulla, the common and pancreatic ducts and the wall of the duodenum and invaded the head of the pancreas. Despite the tendency to local invasion, the curability of these lesions, in contrast to that of carcinoma of the head of the pancreas, by the operation of pancreatoduodenectomy is by now well recognized. This contrast is explained by the essential differences in the pathologic nature of the two lesions. Carcinoma of the papilla usually is less malignant, tends to produce

the outstanding symptom of obstructive jaundice earlier, and to metastasize later than does carcinoma of the head of the pancreas. Miller and co-workers[5] observed that the perineural lymphatics of the duodenum, pancreas and common duct were involved by malignant cells in 66.6 per cent of the 27 cases in which radical operation was done for carcinoma of the head of the pancreas and malignant cells were found in the transected end of the common duct in four of the cases. These phenomena were not observed in relation to lesions of the papilla.

With regard to Case 3 it is noteworthy that although the pancreatic duct was ligated, the patient had no digestive or metabolic disturbance. In the immediate postoperative period, drainage of pancreatic secretion and bile developed and suction was applied to the sinus until the 27th postoperative day when the external sinus was packed and the drainage ceased. In order to explain the excellent gastrointestinal function, one might postulate that when the external sinus was packed an internal sinus formed between the pancreas and a defect in the end of the jejunum.

There seems to be no doubt that the tumor causing the intestinal obstruction in Case 4 was a primary lesion of the small bowel. This is consistent with the now not uncommon observation of multiple primary cancers in a person who probably will die eventually of one of them or of another malignant lesion.

The retention of the rubber tube within the common duct in Case 5 was not intended. Normally such tubes pass in a matter of weeks, but no doubt the dense scarring of the duct produced by the three previous operations caused retention in this instance. It is remarkable that the patient lived despite five years of intermittent obstructive jaundice and the associated cholangitis and liver damage. From the postoperative course it was evident that not only was the common duct filled with bile sediment, but that the hepatic ducts and no doubt many of the interlobar ducts contained the same material due to the prolonged obstruction. It is impossible to say how completely the biliary tract will return to normal function or how long it will take to do so.

1930 Wilshire Boulevard.

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Culdoscopy

STANLEY T. LEE, M.D., *Fresno*

SUMMARY

Cul-de-sac puncture for introduction of a culdoscope is easily made with the patient in the knee-chest position. With the use of the instrument, the pelvic organs can be viewed clearly. Culdoscopic examination of 45 patients was carried out. In all cases in which laparotomy was done after the examination, the culdoscopic observations and diagnosis were confirmed. In no case in which tubal pregnancy was present, was the diagnosis missed in culdoscopic examination. Patients were only slightly uncomfortable after the examination. There was no evidence of pelvic peritonitis in any patient, and no pregnant patient aborted as a result of the procedure.

THE culdoscope is an endoscopic instrument for visualization of the female pelvis through the cul-de-sac. It was designed by Decker and Cherry[1] when attempts to visualize the pelvis through the peritoneoscope were unsatisfactory because of intervening bowel and difficulty in isolating the pelvic organs. A special trocar and cannula are necessary to perforate the cul-de-sac for introduction of the culdoscope. The importance of performing the procedure in the knee-chest position to utilize the negative pressure produced to draw air into the abdomen and thus push the bowel out of the pelvis has been repeatedly stressed by Decker,[1, 2] and it is this contribution which makes the examination possible. Several articles have appeared in the literature[1,2,3,4] reporting considerable experience with the instrument and universal agreement that it is valuable in the diagnosis of pelvic disease. No serious complication following the use of the culdoscope has been reported.

Situations in which culdoscopy has proven useful have been listed by several investigators.[1, 2, 3, 4] The procedure has been of value in the diagnosis of tubal pregnancy with or without rupture, in differentiation of acute salpingitis from acute appendicitis, in the diagnosis of endometriosis, chronic salpingitis, and pelvic tuberculosis, and in the study of the tubes and ovaries in cases of infertility. Benign ovarian cysts have been differentiated from malignant neoplasms. The ovaries have been studied in cases in which there was bleeding without apparent organic cause, and in cases of postmenopausal bleeding when examination of material removed by curettement did not satisfactorily explain the bleeding and a non-palpable ovarian neoplasm was considered possible. In some cases in which a diagnosis of functional disease might have been considered on the basis of the atypical nature of pain in the lower abdomen and the absence of evidence of organic cause so far as could be determined by bimanual pelvic examination, minimal chronic salpingitis or early endometriosis was diagnosed culdoscopically. In general the procedure has proven useful in any situation in which it is desirable to know exactly the anatomical appearance of the ovaries, tubes, uterus, and other pelvic structures without resorting to laparotomy.

Contraindications mentioned are the presence of a fixed mass in the cul-de-sac, senile contracture of the vagina, acute vaginitis, and severe debilitating disease which makes it impossible for the patient to assume the knee-chest position.

During the period from September 1949 to June 1950, 47 patients were culdoscopically examined on the clinic service at Stanford University Hospital. In two cases the culdoscope could not be introduced into the cul-de-sac. In one of these cases the cul-de-sac was obscured by adhesions which had followed an appendectomy and bilateral salpingectomy done when the patient was 14 years of age for "ruptured appendix" and "immature tubes." In the other case the patient had a 10 cm. intraligamentary myoma on one side which caused minimal distortion of the cul-de-sac. In 45 cases the culdoscope was introduced into the pelvis without difficulty. Twelve (27 per cent) of the patients had had previous pelvic operation, either appendectomy or adnexal excision. No patient who had had subtotal or total hysterectomy was examined culdoscopically. Most of the patients examined were selected for the procedure because of suspicion of tubal pregnancy with or without rupture, endometriosis, myomata of the uterus, or chronic salpingitis. In a number of cases the culdoscopy was done as a preliminary procedure in patients scheduled for laparotomy the following day in order to gain experience with the instrument and to correlate the appearance of the pelvic structures through the culdoscope with their appearance at laparotomy.

TECHNIQUE

The patients were prepared as for perineal operation. An enema was given only if there were palpable feces in the lower bowel. No special attempt was made to have the bladder empty at the time of culdoscopic examination. The patients were given 0.2 gm. of Nembutal® one and a half hours before the procedure and 20.0 mg. of Pantopon® one-half hour before. A bimanual examination was done shortly before culdoscopy to be certain that no fixed

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mass obscured the cul-de-sac. The patients were placed in the knee-chest position and assisted in maintaining that position by the attending nurse and a member of the resident staff. A supporting device was not necessary with the patient awake. Very few patients had difficulty staying in position when assisted by two helpers, although in many instances the procedure was longer than would be required for a simple diagnosis, because of the interest of several observers in viewing the pelvis through the culdoscope.

A Sims retractor was placed in the posterior vagina and held in place by an assistant. The posterior lip of the cervix was grasped with a single-toothed tenaculum and the mucosa of the posterior vaginal fornix was stretched. The posterior vault was prepared with 1:1,000 aqueous solution of Merthiolate,® and five to eight cubic centimeters of 1 per cent procaine solution was injected into the mucosa of the posterior vault in the midline 1.5 to 2 cm. from the reflection of the posterior vaginal mucosa onto the posterior lip of the cervix. A 1 cm. transverse incision was made with a scalpel through the area of the procaine wheal. The posterior vault was stretched by traction on the Sims retractor and on the cervix, which converted the incision into a rounded hole sufficient for the passage of the trocar and cannula. An attempt was made to confine this incision to the vaginal mucosa, but occasionally the posterior vaginal septum was so thin that air rushed into the pelvis when the incision was made, indicating that the peritoneum of the cul-de-sac had been pierced. The trocar and cannula were pushed through the pelvic peritoneum into the cul-de-sac. The patient usually had a transient uncomfortable sensation as the peritoneum was divided. The trocar then was withdrawn, permitting a rush of air into the abdomen, and this also caused temporary discomfort.

The distal end of the culdoscope was dipped into a warm saline solution, as was suggested by TeLinde and Rutledge,[3] to prevent fogging over from the body heat, and was then inserted through the cannula and the pelvis was inspected. Often when there was much free blood in the pelvis it was necessary to withdraw the instrument and dip it in the saline solution at intervals to keep the lens clean.

When the examination was completed the culdoscope was withdrawn and the cannula was left in place as the patient was slowly turned on her back. Pressure was put upon the abdomen in order to expel as much air as possible through the cannula, which was then removed. There was a minimal amount of bleeding from the posterior colpotomy wound, and suture of the wound was not necessary.

The examinations were done on the gynecological ward in the treatment room and not in the surgery. The patients were spared an operating room fee, and the examination could be done immediately when the occasion arose without regard for operating room schedules. Medical personnel did not wear caps, masks, or gowns. All patients were hospitalized overnight following the procedure, and the majority were dismissed ambulatory within 24 hours.

Among the patients examined culdoscopically were 11 with severe unilateral pelvic pain and an abnormal menstrual history. It could not be determined by bimanual examination whether or not tubal pregnancy without rupture was presented, and the severity of the pain was such that it was considered imperative that a positive diagnosis be made quickly. Only one of these patients had tubal pregnancy. Three patients had chronic salpingitis, five had intra-uterine pregnancy, one had a normal pelvis, and one had old postoperative adhesions. It is reasonable to believe that in some of these cases continued severe pain would have led to unnecessary laparotomy. No hormonal therapy was given to the patients who were pregnant at the time of examination, and neither uterine contractions nor bleeding developed. One of the patients aborted triplets three months after the examination, and another who desired not to be pregnant aborted under suspicious circumstances 40 days after examination. The other three patients delivered normal infants at term.

A sixth pregnant patient was subjected to the procedure in order that an ovarian cyst might be inspected. Laparotomy then was done, in the sixth weeks of gestation, and the cyst, containing the corpus luteum in its wall, was excised. The patient was given progesterone orally and parenterally. There was no tendency to abort, and a normal infant was delivered at term.

Five patients were examined culdoscopically because of severe peritoneal irritation with evidence of intra-abdominal bleeding noted on bimanual examination. Three of them had tubal pregnancy with rupture of the tube. In the other two cases there was rupture of a corpus luteum with bleeding into the pelvis, brisk enough to necessitate laparotomy in one case. In the other, a clot was observed over the corpus luteum, and as no fresh bleeding was noted the patient was kept under observation for two days and then dismissed. The pelvis was normal to palpation three weeks later. Had posterior colpotomy alone been relied upon in this case, the finding of blood in the cul-de-sac would probably have led to a mistaken diagnosis of ruptured tubal pregnancy and to unnecessary laparotomy.

Nine patients had complained of progressive dysmenorrhea which seemed severe enough to suggest the possibility of early endometriosis, although no evidence of it was noted in bimanual examination. In culdoscopic examination, brownish implants in the ovaries were noted in two patients. Two had chronic salpingitis. Five had a normal pelvis.

The culdoscope was used in a variety of other conditions. In a case in which the uterus was perforated during a diagnostic curettage, it was used to determine the position of the perforation and the amount of bleeding. A small ragged laceration in the posterior fundus was observed. It had a small clot over it and there was no fresh bleeding. The patient recovered without incident. One patient

was so obese that several examiners could not make certain by palpation whether or not a pelvic tumor was present. Upon culdoscopic examination, the uterine corpus was observed to be enlarged to four or five times normal size by multiple intramural myomata. One young patient with large subserous myomata who desired to bear children was culdoscopically examined to determine whether the myomata were sufficiently pedunculated that they might be excised without damage to the corpus. The tumors were found to be arising by slender pedicles and were subsequently excised. Two patients with primary amenorrhea were examined with the culdoscope. In one the ovaries were extremely small and white with no evidence of any follicular activity. In the other both ovaries were larger than normal and contained multiple small follicle cysts. Two patients with severe pelvic pain which appeared to be on a psychosomatic basis were culdoscopically examined and no organic disease was noted. A patient with tuberculosis of the endometrium, proven by guinea pig inoculation, was examined with the culdoscope and no evidence of tubercles on the tubes or elsewhere in the pelvis was observed.

DISCUSSION

An attempt was made in the course of this study to evaluate the usefulness of the instrument and to look for any disadvantages. A physician pondering such a procedure might wonder about the difficulty of entering the cul-de-sac; whether the pelvic organs can be clearly seen through the culdoscope; whether puncture of the cul-de-sac through the vagina will introduce infection into the pelvis; whether the postoperative abdominal discomfort following spontaneous pneumoperitoneum can be well controlled; and whether the examination, involving as it does traction on and manipulation of the cervix, will promote abortion in pregnant patients.

As was previously noted, the cul-de-sac was entered on 45 out of 47 attempts. In three patients who, upon examination, were observed to have chronic pelvic inflammatory disease, there was increased thickness and increased vascularity of the posterior vaginal septum. In those cases, introduction of the trocar into the cul-de-sac was more difficult than usual and an increased although not alarming amount of postoperative bleeding was observed.

The pelvic structures were clearly seen through the culdoscope. The uterine corpus and the ovaries were readily visualized and could be studied in minute detail. The tubes tend to hang over the broad ligament, and often pressure in the lower quadrants applied by the culdoscopist or an assistant was necessary to bring the full length of the tubes into view. In only two cases in the series was the appendix seen.

In 27 of the 47 cases, only culdoscopy was done. In five cases dilatation and curettage were carried out after the examination, and in 15 cases laparotomy. Of the 32 patients who did not have laparotomy, only one had febrile response. The patient, who had numerous psychosomatic complaints, refused to drink water after the procedure, and the temperature rose to 38.8° C. the evening after the examination and again the next day. There were no localizing signs or symptoms. The patient was given antibiotics, and the temperature returned to normal on the second day. None of the 31 afebrile patients was given antibiotics. Of the 15 patients who had laparotomy after culdoscopic examination, ten had fever postoperatively. One had urinary tract infection which responded to therapy with sulfa drugs. Four patients had chronic pelvic inflammatory disease and were given penicillin daily. Four patients were given no antibiotics. In none of these cases did the temperature elevation last beyond the second postoperative day. In the tenth patient a massive broad ligament hematoma developed after salpingectomy for ruptured tubal pregnancy. The temperature spiked to 38° C. daily. It was not affected by antibiotics and was still present on the 15th postoperative day. Two months after operation the pelvis was normal to palpation. In none of the 47 cases did the culdoscopic procedure introduce infection into the pelvis, nor was the postoperative course of patients who had abdominal operations affected by the preoperative culdoscopic examination.

Postoperative discomfort from pneumoperitoneum was minimal in most instances, and shoulder pain, when it occurred, was lessened to a great extent by having the patient again assume the knee-chest position, which helped to move the air out from under the diaphragm and back into the pelvis. Spontaneous pneumoperitoneum from passage of air through the posterior colpotomy wound when the patient again assumed the knee-chest position did not occur in this series. Although acetylsalicylic acid and codeine was ordered routinely for relief of postoperative discomfort in the 32 cases in which laparotomy was not done, 20 of the patients did not ask for any analgesic. For the 12 patients who did need postoperative analgesia, one or two codeine tablets sufficed.

1310 Olive Avenue.

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CASE REPORTS

Hypernephroma in an 8-Year-Old Child

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AS hypernephroma is rare in young persons, and as no report of occurrence in a young child could be found in the literature, the following case is reported.

REPORT OF A CASE

An eight-year-old girl was admitted to the White Memorial Hospital on May 28, 1951, for investigation of mental retardation, and in the course of routine physical examination a mass was palpated in the left flank. The child's mother stated that she had been aware of the mass for three months and that the child had complained of pain in that region during that time. There were no complaints referable to the genito-urinary system.

The patient was thin but appeared to be in good health. The systolic blood pressure was 100 mm. of mercury and the diastolic pressure 88 mm. The mass in the left flank, about 5 cm. in diameter, was moderately tender and freely movable, although it did not move with respiration. No other abnormalities were noted in the physical examination.

The hemoglobin content of the blood was 12.6 gm. per 100 cc. Leukocytes numbered 10,000 per cu. mm. Results of urinalysis were within normal limits. In an excretory urogram the right kidney appeared normal, but the pelvis and calyces of the left kidney were not completely outlined by the contrast medium. There was no evidence of renal enlargement or displacement. A left retrograde pyelogram was made and slight blunting of the lower calyx was observed, but no renal enlargement was noted (Figure 1). The rectum and colon were examined roentgenographically and appeared to be normal. In view of the indeterminate results of pyelography, it was deemed advisable to explore the mass in the left flank transperitoneally.

A left subcostal incision was made, extending from the lateral border of the rectus muscle to the mid-axillary line of the flank. The peritoneal cavity was entered and the mass was palpated in the left retroperitoneal space. It was attached to the lower pole of the left kidney (Figure 2). The peritoneum was then closed and its contents were retracted medially, thereby exposing the mass and the left kidney. The mass, which was approximately 6 cm. in diam-

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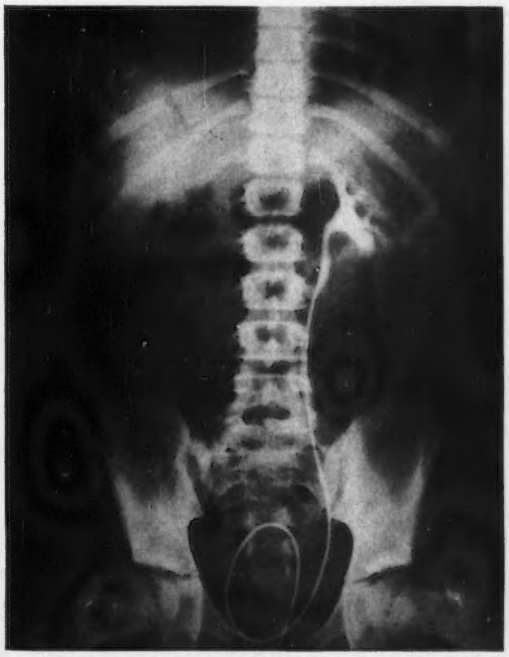

Figure 1.—Left retrograde pyelogram showing slight blunting of lower calyx.

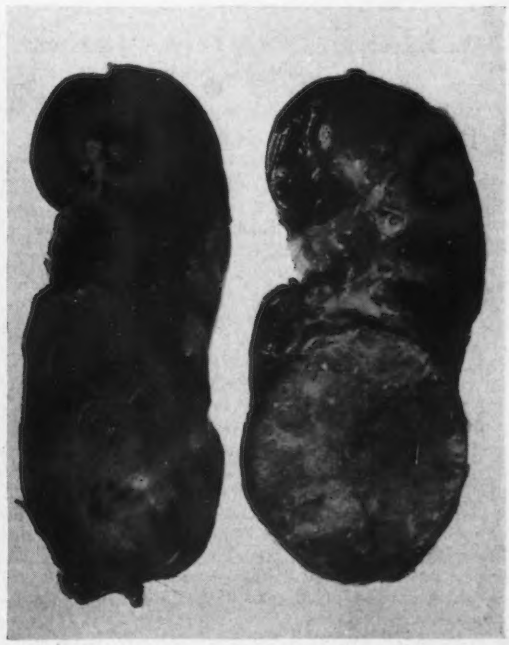

Figure 2.—Left kidney with tumor of lower pole.

Figure 3.—Clear cell carcinoma of kidney.

eter, arose from the lower pole of the left kidney and was adherent to the neighboring structures by loose fibrous bands. The capsule of the mass contained many large dilated vessels. Gerota's fascia was incised and the left renal pedicle was exposed. The ureter was clamped, divided and ligated. Three Carmalt clamps were placed on the renal pedicle and it was divided and doubly ligated with No. 1 chromic catgut. The kidney and mass were then mobilized and removed.

The kidney measured 9 by 4.5 by 2.7 cm. and a well encapsulated tumor measuring 6 by 5 by 4 cm. was attached to the lower pole (Figure 2). The histologic diagnosis was clear cell adenocarcinoma of the kidney (Figure 3).

4036 Wilshire Boulevard.

The Effect of ACTH in Severe, Recurrent Chorea

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INFECTIOUS chorea, commonly called Sydenham's chorea, is the most frequent central nervous system manifestation of rheumatic fever.[3, 7] The condition occurs chiefly in children and tends to be self-limited.[9] It is seldom fatal, although in rare instances it may be characterized by rapid, progressive hyperthermia and death.[6]

Recently, a case of unremitting and alarmingly severe infectious chorea in a 22-year-old woman was observed. Because the disease did not respond to ordinary measures and because of its progressive nature, therapeutic trial of adrenocorticotropic hormone (ACTH) was made.

Recent studies have indicated that many of the important manifestations of rheumatic fever are favorably influenced by ACTH or cortisone. Massell and co-workers[4, 5] treated two patients with moderately severe chorea with ACTH and reported definite and continued improvement in one, no favorable effect in the other. More recently, Aronson and co-workers[1] reported two cases in which cortisone did not appear to influence the course of chorea. Immediate and lasting response to treatment with ACTH was noted in the case here reported.

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REPORT OF A CASE

A 22-year-old woman entered the University of California Hospital on the neurological service on October 23, 1950, because of severe choreatic movements of the entire body.

The patient's mother reported that the patient had had a similar attack at the age of 13 years. The first episode, which was of sudden onset, was described as being accompanied by fever and by cardiac disturbance of unspecified type. The right side of the body was affected more severely than the left, with uncontrolled movements of the right hand, arm and leg. There was some interference with speech and with swallowing. The patient was placed on a schedule of sedation with phenobarbital, in unknown amount, and rest in bed. In approximately one month she became free of symptoms. Until the present illness, according to the patient and her mother, there had been no sequelae or recurrence.

The present illness started in September 1949, during the sixth month of a second pregnancy. Because of mild but uncontrolled, repetitive motion of the right arm and hand, the patient could not perform fine movements of the hands such as those required for crocheting and writing. During the remainder of pregnancy the neurological symptoms became no worse, and she was able to care for her household without aid. A healthy child was delivered spontaneously at term.

During the following five months, the patient was relatively free of symptoms, except for a feeling of extreme nervousness. In April 1950, severe soreness of the throat developed; 300,000 units of penicillin was given, with apparent recovery after 48 hours. In June 1950, the patient rubbed a blister on the right ankle. The abrasion became infected and red streaks which extended up into the knee appeared on the leg. Penicillin was given in unknown amounts.

At that time the patient noticed that her right hand began to "fly around," and that she was unable to hold objects. By July these movements involved the right arm and leg. During August and September, slurring of speech became apparent. At first, these episodes were intermittent, but they became progressively worse and more frequent, so that the patient had difficulty in eating, doing housework, and caring for her children. During the same period the repetitive movements began to involve the left side of the body, affecting first the arm and then the leg. In October, the patient noticed that it was becoming extremely difficult to swallow. By this time the movements of the body had become so violent that she was unable to care for her personal needs.

Upon examination on October 23, 1950, it was noted that the movements were choreatic in form and character, and they were of such extreme violence that immediate hospitalization was necessary to ensure adequate nursing care.

The patient was observed to be poorly nourished, as was evidenced by obvious loss of weight and dry skin. There were many bruises over the face, arms, legs and torso. The temperature and blood pressure were normal. A Grade II systolic murmur which was transmitted weakly to the left axilla was heard at the apex of the heart. Medial to the apex impulse, a prominent third heart sound was audible. No other physical abnormalities were noted.

In neurological examination, choreatic movements of the entire body—violent, uncontrolled and purposeless twisting—more pronounced on the right side than on the left, were noted. There was pronounced impairment of speech, and the patient was unable to swallow. No other neurological abnormalities were noted.

The patient was placed in a padded bed and was fed parenterally, either by intravenous infusion or by intubation.

Paraldehyde in doses of 8 cc. every three hours provided only a minimal amount of rest; between doses it was necessary to give phenobarbital sodium intramuscularly in doses of 0.13 gm. Although the dosage of paraldehyde was increased gradually from 8 cc. to 15 cc. every three hours, the patient had relief for periods of no longer than an hour and a half during the first three days in hospital. To supplement the paraldehyde, a 10 per cent solution of chloral hydrate was given intramuscularly in 10 cc. doses. In spite of this, the condition of the patient continued to grow worse. By October 26, the choreatic movements had increased to such severity that she was literally beating herself to death, and increasing mental deterioration was noted. It was the consensus of the staff of the neurological service that without new and drastic therapy the illness would lead rapidly to exhaustion and death.

Because of the reports on the use of ACTH in the treatment of rheumatic fever, it was decided that therapeutic trial of the hormone was warranted. The initial dose was injected on October 26, and the total in each 24 hours was 80 mg., given in four doses of 20 mg. each. This schedule was continued for five days.

During the first 24 hours of administration of ACTH, the patient became quieter and more manageable and needed less attention from the special duty nurse. Sedatives gave her longer periods of rest; it was necessary to administer them only twice in the 24-hour period. During the next 12 hours the patient improved dramatically. She was able to speak intelligibly, to swallow fluids and solids, and to write, put on lipstick and comb her hair.

By the sixth day the patient could crochet—for the first time in a year. She was returned to the ward, where only routine nursing care was given. The dosage of ACTH was reduced to 60 mg. each 24 hours, given in three divided doses of 20 mg. each. After six days on this dosage, the amount of ACTH was reduced to 25 mg. each 24 hours. Improvement, both physical and mental, continued and at the end of three more days all medication was stopped. When chorea did not recur in the next four days, the patient was discharged.

Examined periodically in the out-patient department, the patient when last observed, February 19, 1951, had had no recurrence of chorea. Only mild restlessness of the right hand, which caused no functional impairment, remained. There was no change in the sounds at the apex of the heart, which were coincident with mitral insufficiency.

Results of laboratory studies performed before, during, and following administration of ACTH were as follows: The erythrocyte sedimentation rate (Wintrobe) was abnormally rapid before treatment (36 mm. in one hour) but returned to normal (15 mm. in one hour) during therapy. Antistreptolysin titer was at a level (333 Todd units) consistent with an antecedent streptococcal infection and was not changed by ACTH. The cerebrospinal fluid was normal except in one respect: The concentration of ascorbic acid was initially low (1.34 mg. per 100 cc.) but increased gradually to the normal range (2.1 mg.). The significance of this change is uncertain. The results of electrophoretic analysis of the serum proteins were of particular interest and will be the subject of a subsequent report.

The response to ACTH was followed by a significant drop in the quantitative eosinophil count. Results of complete counts of blood cells and of urinalysis were within normal limits at all times. Determination of serum electrolytes revealed no evidence of alkalosis. Studies of the blood sugar, serum protein and albumin-globulin ratio, and creatinine clearance showed no changes. No unusual organisms were noted in bacteriological studies of smears and cultures of the throat and of urine sediment.

X-ray films of the chest, heart, left hand, and the skull, and Water's views of the sinus revealed no evidence of disease.

In an electroencephalogram there were "borderline findings of slightly abnormal character [that] could be found in about 15 per cent of normal individuals . . ." No abnormalities were observed in two electrocardiograms.

DISCUSSION

In view of the well known variability of infectious chorea, it is possible that spontaneous remission coincided with the administration of ACTH. The evidence against this supposition, however, is overwhelming.

Recurrent infectious chorea runs a more prolonged course when it is associated with pregnancy. The average duration of chorea is one month, in contrast to an average duration of 3.3 months when it occurs in conjunction with pregnancy.[8] In the case here reported, the disease was unremitting and progressive for five months. It became alarmingly severe during the last month and despite maximum supportive therapy during hospitalization, the patient was near exhaustion. The disease was still in the ascendancy when ACTH was first administered. The promptness of improvement following the use of ACTH strongly suggested therapeutic response rather than spontaneous change.

Since the pathological process in chorea, regardless of its severity, is exudative rather than proliferative in character,[2] potentially the disease is completely reversible. For this reason the use of ACTH (or cortisone) appears to be indicated in the treatment of cases of infectious chorea. It is possible that ACTH will shorten the course of the disease and prevent death by favorably altering the exudative reaction in the brain. Final judgment regarding the practical and fundamental value of ACTH (or cortisone) in the treatment of chorea will be forthcoming only after careful study of a representative series of cases.

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EDITORIALS

A New Problem for C.P.S.

California newspapers blasted out in righteous indignation late last month when they discovered, via *Time* magazine, that a few physician members of California Physicians' Service had been apprehended in calculated plans to withdraw from C.P.S. funds more than they were rightfully entitled to. The *Time* story, in turn, was taken from an editorial, "Robbing Peter to Pay Paul," that appeared in the March 6, 1952, issue of the *Bulletin* of the Los Angeles County Medical Association.

Thus a sincere attempt to clear up a sore spot within the confines of the medical family broke into public print, with overtones not too flattering to the medical profession. The ordinary machinery of the county and state organizations, capable of dealing with a problem of this nature, was interrupted in its normal procedure.

Many physicians have since asked themselves what profits it if they adhere to an organization of their own making, with a vast potential for economic and legislative good, if some of their fellows make that organization a private province for their own financial gain. The question comes naturally and deserves an answer.

The answer lies in the fact that C.P.S. has awakened to a realization that some of its professional members have not shot square; once that fact is established, the remedy is obvious. Publicity within the ranks of the profession itself, in this case through a county society bulletin, is bound to have a salutary effect on some of the erring brothers. More stringent remedies are available if that one does not work effectively. Meanwhile, it should be pointed out that the financial loss, if any, is on the shoulders of the other professional members of C.P.S., not those of the public. Where a small number of physicians take it upon themselves to raid a pooled fund, there is that much less left in the fund to pay the vastly larger number of participating doctors who bill honestly for their services. Ergo, a reduced unit value.

Certainly, in the course of the investigation that C.P.S. undertook nearly a year ago, with the knowledge and consent of the C.M.A., cases will be uncovered where there is overcharging because of ignorance of procedures or a lack of study of the proper way to assemble a statement under the C.P.S. program. Clerical errors may account for additional cases. These are subject to clarification and adjustment.

In the other cases, the few where flagrant abuses amounting to outright dishonesty are disclosed, the county medical societies and subsequently perhaps governmental authorities may see fit to take active steps. We need not list here the various punishments or penalties that might be imposed; suffice it to say that physicians guilty of such conduct cannot expect to have the charges lightly dismissed. Under all the rules of the game, including the law, the principles of medical ethics and the rules of common sense and fair play, those guilty of such abuses should be brought to the proper bar of justice, preferably by their fellow practitioners.

The Annual Session

Soon the 1952 Annual Session of the California Medical Association will convene in Los Angeles. Members of the Association and their guests will again be able to concentrate in a few days' time a real postgraduate course which is not easily produced and is seldom matched.

This year the meeting will honor an outstanding list of guest speakers, will house the largest number of technical and scientific exhibits ever assembled by the C.M.A. and will welcome what promises to be the largest registration in the organization's history.

In pride mixed with rue it must be reported that the Association's annual meetings have now grown to the size where it is becoming increasingly difficult to find quarters adequate to house them. Still, hotel accommodations are available and all are welcome.

Letters to the Editor . . .

Dangers of Cure-Alls: Multiple Vitamin Mixtures in Pernicious Anemia

In the past, the development of neurological symptoms in pernicious anemia prior to anemia has been unusual. However, Conley and Krevans[1] observed that five out of ten patients with previously unrecognized pernicious anemia observed at Johns Hopkins Hospital in the year 1950 complained only of the neurological symptoms and had little or no anemia. Investigation revealed that each patient had been taking multivitamin preparations. In four of the five it was possible to identify the preparation used, and in each there was enough folic acid to produce a hematologic remission in patients with pernicious anemia.

A survey of proprietary vitamin products widely available as of January 1951 revealed that more than 80 contained folic acid despite the relatively limited occurrence of folic acid deficiency states. The recommended dose of these preparations was sufficient to supply at least 5 mg. of folic acid daily—enough to maintain prolonged hematologic remission in pernicious anemia.[2] On the other hand, although the blood of persons with pernicious anemia who are taking such vitamin complexes may remain normal, subacute combined degeneration[3] may develop progressively.

The *Journal of the American Medical Association* in a recent editorial[4] emphasized the danger of masking pernicious anemia through the use of such multivitamin preparations containing folic acid. Since there is a growing tendency on the part of some manufacturing pharmacists to offer a variety of multiple mixtures as a cure-all for a host of ills, in the future physicians may expect to see a number of variants of diseases which are due to one or another masked deficiency.

EDGAR WAYBURN, M.D.
San Francisco

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2. Bethell, F. H., et al.: Further studies on utilization of pteroyl hexaglutamyl glutamic acid (vitamin Bc conjugate) in pernicious anemia, J. Lab. & Clin. Med., 32:337, 1947.

3. Vilter, C. F., Vilter, R. W., and Spies: Treatment of pernicious and related anemias with synthetic folic acid, J. Lab. and Clin. Med., 32:262, 1947.

4. Journal of the American Medical Association, 148:57, Jan. 5, 1952.

Cultures for Diagnosis of Diphtheria

I believe that it might be appropriate to suggest to the profession a warning regarding reliance upon throat cultures as a dependable means for the diagnosis of diphtheria under conditions which now exist.

Within the memory of many present-day physicians diphtheria was a constant threat and throat cultures were routine in every case of tonsillitis with or without exudate. Because of almost universal immunization, children are now protected by their own artificially induced immunity and additionally are protected by the immunity of those with whom they are in contact. Adults are similarly protected by diminution in the possibilities of exposure even though they are not themselves immune to the infection. Infectious mononucleosis and other infections of the throat which may simulate diphtheria have accordingly become much commoner than diphtheria and the physician is no longer alert to diphtheria as an ever-present menace.

The history of this disease, however, is one of periodic alterations in prevalence, and the future will doubtless see challenge to the immune state of those subjected to immunizing injections and to that of adults who have not been given such protection.

The especial warning applies to the fact that diphtheria is no longer suspected by the clinician at the onset of many throat infections, and in many cases, as judged by the experience in a communicable disease hospital, throat cultures will first be employed only after the patient has received one or more injections of penicillin. Penicillin is not an effective agent in the treatment of diphtheria; antitoxin is the only acceptable means of therapy. Nevertheless, experience in the treatment of the carrier state indicates that the growth of diphtheria bacilli on culture from the throat may be completely inhibited by injections of this antibiotic. Accordingly reliance upon throat cultures for the diagnosis of diphtheria necessitates that cultures be taken before any antibiotic agent is given to the patient. At the moment the problem does not seem to be of serious proportions but if the natural history of the disease is repeated in the near or distant future, it will be readily possible for many cases of diphtheria to escape detection until clinical symptoms have reached a dangerous level unless material for culture is taken from the throat before the administration of antibiotic drugs.

E. B. SHAW, M.D.
San Francisco

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NOTICES AND REPORTS

Council Meeting Minutes

Tentative Draft: Minutes of the 388th Meeting of the Council, San Francisco, February 10, 1952.

The meeting was called to order by Chairman Shipman at 9:30 a.m., Sunday, February 10, 1952, in Room 220 of the St. Francis Hotel, San Francisco.

Roll Call:

Present were President MacLean, President-elect Alesen, Speaker Charnock, Councilors West, Loos, Sampson, Morrison, Dau, Montgomery, Lum, Green, Pollock, Frees, Heron, Thompson, Shipman and Varden, and Secretary Daniels.

Absent for cause: Councilors Ray and Bailey, Editor Wilbur.

A quorum present and acting.

Present by invitation during all or a part of the meeting were Vice-Speaker Randel, Drs. Russel V. Lee, Malcolm Merrill of the State Department of Health, Francis J. Cox; John F. Ellis and George W. Garner of Kern County; Executive Secretary Hunton, Assistant Executive Secretary Thomas, Legal Counsel Hassard, Messrs. Ed Clancy, J. L. Pettis and Glenn W. Gillette of public relations staff; Dr. Francis Hodges and Messrs. W. M. Bowman and John McMahon of California Physicians' Service; Messrs. Clem Whitaker Jr. and Ned Burman of public relations counsel; Mr. Ben H. Read, executive secretary of the Public Health League of California; county society executive secretaries Venables of Kern, Cochems of Los Angeles, Bannister of Orange, Kihm of San Francisco, Wood of San Mateo, and Nute of San Diego; Mr. K. L. Hamman of California Physicians' Service and Dr. Chad M. Harwood, secretary of the Orange County Medical Association.

1. *Minutes for Approval:*

On motion duly made and seconded, minutes of the 387th Council meeting, held December 1-2, 1951, were approved.

2. *Membership:*

(a) On motion duly made and seconded, one member whose 1951 dues had been received since the last Council meeting was reinstated.

(b) A report of membership as of February 8, 1952, was received and ordered filed.

(c) On motion duly made and seconded in each instance, four applicants were elected to Retired Membership. These were:

Rene Bine, Gordon E. Hein, Joseph L. McCool, all of San Francisco County; Ione Pinney, San Joaquin County.

(d) On motion duly made and seconded in each instance, eleven applicants were elected to Associate Membership. These were:

Barbara E. Dittmann, Alameda-Contra Costa; W. C. Buss, Kern County; Emma Wharton, Orange County; Roy N. Taylor, Riverside County; Evelyn Ballard, Charles F. Drake, Felix O. Kolb, Lester A. Mallette, Kenneth Poppen, Olga Rosasco-Loos, San Francisco County; Freeman H. Adams, San Joaquin County.

(e) On motion duly made and seconded in each instance, reductions of dues because of illness or postgraduate studies were voted for ten applicants.

3. *Financial:*

(a) A report of bank balances as of February 8, 1952, was received and ordered filed.

(b) A report of income and expenditures for January and for the seven months ended January 31, 1952, was received and ordered filed.

(c) A request of the American Medical Education Foundation for a contribution from the Association was read and discussed. It was regularly moved and seconded that the American Medical Education Foundation be advised that California would do its share in the national campaign, through either individual or association subscriptions. An amendment to the motion was regularly moved and seconded, calling for the appointment of a committee to handle the solicitation of subscriptions in California, and the amendment was adopted. On vote, the motion as amended was adopted.

(d) A request from the Woman's Auxiliary for the appropriation of an additional $1,000 to help

meet the annual meeting expenses of the Auxiliary was read and discussed. On motion regularly made and seconded, an appropriation of an additional $1,000 to the Woman's Auxiliary was voted, the roll call showing more than a three-fourths favorable vote.

4. *State Department of Public Health:*

Dr. Malcolm Merrill, Acting Director of the State Department of Public Health, reported on recent changes in personnel in the health departments in San Francisco, Alameda, Mendocino and Imperial counties. Among these changes is the appointment of Dr. Clarence R. Kroeger, formerly of Imperial County, as health officer of Mendocino County, in accordance with recommendations made in a recent health resource study in that county.

Dr. Merrill also reported on the production of preliminary regulations to govern laboratories using animals in research. He also reported on revisions being made in regulations of the Crippled Children's Act and the Clinical Laboratories Act. He stated that there was some indication that federal funds to his department would be decreased somewhat in the 1952-53 fiscal year and that the state health budget would be essentially unchanged from the present figures.

In response to questions, Dr. Merrill stated that state funds for aid in hospital construction would probably amount to about 50 to 60 per cent of federal funds, which are now estimated at about $2,500,000 for the coming fiscal year. On another question he stated that the names of patients were required in reports of the tumor registry for purposes of eliminating duplications and for checking against mortality records. Some 92,000 names are now on the tumor registry, dating back to 1942, and about 12,000 new cases are added each year. These records are confidential.

Dr. Merrill reported that two items of proposed legislation are being prepared for the 1953 legislative session. One of these would consider the revision of rabies control measures in order to secure a more uniform system of rabies control. The other would be in response to a resolution of the California Conference of Local Health Officers, asking for standardized requirements for milk pasteurization.

Dr. C. V. Thompson reported on a meeting with a committee of the California Conference of Local Health Officers, at which problems relating to rabies control, to the use of silver nitrate or other preparations in the eyes of the newborn and to tetanus control, were discussed. On motion duly made and seconded, it was voted to appoint a committee to study these problems.

5. *California Physicians' Service:*

Dr. Francis T. Hodges, secretary of California Physicians' Service, reported on current activities of C.P.S., including its own internal business study and its cooperation with C.M.A. committees studying its character and its fee schedule. A new physician's manual and a new hospital manual have been issued, with complete instructions on the handling of C.P.S. claims.

6. *District Hospitals:*

Drs. Ellis and Garner of the Kern County Medical Society detailed to the Council the progress of a hospital district in their county, with its financing difficulties and its organizational set-up. They reported on several items in the existing hospital district statutes which they felt should be amended for clarity and left proposed amendments on these points. On motion duly made and seconded, it was voted to refer these proposals to the Committee on Public Policy and Legislation.

7. *Disciplinary Action:*

At the request of the Alameda-Contra Costa Medical Association and on motion duly made and seconded, it was voted to appoint Mr. Arthur H. Connolly, Jr., as referee to conduct hearings on charges of unprofessional conduct against a member of that association.

8. *1952 Annual Session:*

(a) Dr. Daniels requested that the second meeting of the House of Delegates at the 1952 Annual Session be held at 1:30 p.m. instead of a morning hour, and on motion duly made and seconded, this change was approved.

On motion duly made and seconded, the list of guest speakers for the Annual Session was approved.

Dr. Charnock, Speaker of the House of Delegates, suggested the possibility of eliminating the vocal roll call in the interest of saving time. It was agreed to mail advance registration cards to Delegates and Alternates as a means of speeding this process.

(b) Mr. Hunton reported on the difficulties encountered in securing adequate accommodations for the Annual Session and he was authorized to carry on advance negotiations for meeting places in 1953 and 1954.

9. *Industrial Fee Schedule:*

Dr. Francis J. Cox, chairman of the Committee on Industrial Accident Commission, discussed the draft of a proposed fee schedule drawn up by his committee. After discussion, it was regularly moved, seconded and voted that the schedule as drawn be approved as a work sheet and the committee be instructed to carry on this work.

10. *Foreign Medical Students:*

Dr. Francis Scott Smyth, Dean of the University of California School of Medicine, reported on difficulties faced by medical schools in accepting foreign students for postdoctorate training. He presented proposed legislation which would control such training within desired limits without creating problems reflecting adversely on the countries from which such students come. On motion duly made and seconded, the intent of such legislation was approved.

Dr. Smyth also discussed some problems relating to extension courses for other professional groups and urged that attention be paid to the progress of such groups.

11. *Student A.M.A.:*

Dr. Charnock reported on the attendance of five California medical students at the December 27-28 meeting of the Student A.M.A. Representatives of all California schools except Stanford participated and expressed their thanks to the C.M.A. for having financed their trips.

12. *Legal Department:*

Mr. Hassard reported that oral arguments in the San Diego case had consumed more than three days. He discussed the issues in the case and reported that costs to date had been more than the initial appropriation. On motion duly made and seconded, it was voted to appropriate an additional $4,500 to meet current costs of the case, the roll call showing more than a three-fourths affirmative vote.

Mr. Hassard also reviewed the history of the Hospital District Act and its amendments and discussed the recent opinion of the Attorney General in the Merced General Hospital case.

13. *Advisory Planning Committee:*

Mr. Hunton reported that the Advisory Planning Committee had met on February 8 and had discussed the current public relations program. The committee decided to retain Mr. Ken Young, now assistant executive secretary of Los Angeles County Medical Association, as a member and had voted to request the Council to appoint Mr. Everett Bannister, executive secretary of the Orange County Medical Association, as a member. On motion duly made and seconded, Mr. Bannister was elected to membership.

Mr. Hunton also reported that an offering of a public relations plaque for physicians' offices would be made to all members of the Association.

14. *Public Relations:*

Mr. Clem Whitaker, Jr., reported on current political activities and sugested that a radio broadcast of the inaugural address of the 1952 incoming C.M.A. president be made statewide. On motion duly made and seconded, it was voted to approve this broadcast.

15. *Public Policy and Legislation:*

Mr. Ben Read urged that interest be taken in the June primary and the November general elections and stressed the importance of maintaining contact with the interim committees of the State Legislature. Mr. J. L. Pettis reported on his recent visit to Honolulu, where he addressed two large groups.

16. *California Medicine:*

A proposal that CALIFORNIA MEDICINE carry as a supplement a series of articles produced in another state was discussed and it was regularly moved, seconded and voted to disapprove this proposal.

17. *Catastrophic Insurance:*

Dr. MacLean discussed a letter sent to him by Dr. John W. Cline in which the suggestion was made that a committee be appointed to discuss with insurance underwriters the possibility of writing catastrophic health insurance coverage. On motion duly made and seconded, this matter was voted referred to the insurance committee headed by Dr. Lum.

18. *Membership Provisions:*

Dr. West discussed the case of a county society member who wished to remain a county society member but not affiliate with the American Medical Association or the C.M.A. It was agreed that legal counsel should draft a by-law amendment which would spell out the present implied requirement that active members of county medical societies must maintain simultaneous membership with the state and national organizations.

19. *Time and Place of Next Meeting:*

The chairman announced that the next meeting of the Council would be held in Los Angeles on April 26, 1952.

Adjournment:

On motion duly made and seconded, the meeting was adjourned in memory of Dr. John D. Ball, deceased Councilor from the Second Councilor District, with a message of sympathy to be forwarded to Mrs. Ball.

SIDNEY J. SHIPMAN, M.D., *Chairman*
ALBERT C. DANIELS, M.D., *Secretary*

In Memoriam

ARMEN, GARO H. Died in Los Angeles, February 6, 1952, aged 73. Graduate of George Washington University School of Medicine, Washington, D. C., 1905. Licensed in California in 1924. Dr. Armen was a retired member of the Los Angeles County Medical Association and the California Medical Association, and a Fellow of the American Medical Association.

✤

BURNHAM, CLARK J. Died in Berkeley, February 15, 1952, aged 83, of cerebral hemorrhage. Graduate of the University of California Medical School, Berkeley-San Francisco, 1891. Licensed in California in 1892. Dr. Burnham was a retired member of the Alameda-Contra Costa Medical Association, and the California Medical Association, and an Associate Fellow of the American Medical Association.

✤

FRANDY, MERVYN F. Died in Oakland, February 17, 1952, aged 57. Graduate of the University of California Medical School, Berkeley-San Francisco, 1920. Licensed in California in 1920. Dr. Frandy was a member of the Alameda-Contra Costa Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

✤

KIGER, WILLIAM H. Died in Los Angeles, February 10, 1952, aged 75. Graduate of Toledo Medical College, Ohio, 1900. Licensed in California in 1901. Dr. Kiger was a mem-

ber of the Los Angeles County Medical Association, a life member of the California Medical Association, and a Fellow of the American Medical Association.

✤

PRINCE, RUSSELL W. Died in San Bernardino, November 27, 1951, aged 67, of acute coronary thrombosis. Graduate of the California Eclectic Medical College, Los Angeles, 1916. Licensed in California in 1916. Dr. Prince was a member of the San Bernardino County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

✤

SNEDAKER, JR., JOHN F. Died in an airplane accident in Idaho, October 19, 1951, aged 55. Graduate of Columbia University College of Physicians and Surgeons, New York, 1923. Licensed in California in 1926. Dr. Snedaker was a member of the Los Angeles County Medical Association, the California Medical Association, and the American Medical Association.

✤

STIBBENS, FRANK H. Died in Oakland, February 13, 1952, aged 73. Graduate of Cooper Medical College, San Francisco, 1903. Licensed in California in 1904. Dr. Stibbens was a member of the Alameda-Contra Costa Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

✤

WALD, ERNEST E. Died in San Francisco, September 9, 1951, aged 52. Graduate of Ludwig-Maximilians-Universität, Medizinische Fakultät, München, Bavaria, Germany, 1923. Licensed in California in 1941. Dr. Wald was a member of the San Francisco Medical Association, the California Medical Association, and the American Medical Association.

Correction

The second meeting of the House of Delegates at the Annual Session of the California Medical Association is scheduled for Tuesday, April 29, at 1:30 p.m.—not at 9:30 a.m. as printed on page 183 of the March issue of CALIFORNIA MEDICINE.

Questions and Answers about C. P. S.

Question: **Are Spanish-American War veterans required to pay for medication, or can their prescriptions be filled at government expense as are those of other classes of eligible veterans?**

Answer: Veterans Administration regulations governing the out-patient prescription program do not exclude any class of eligible veterans. Therefore, Spanish-American War veterans are entitled to have prescriptions filled at government expense (i.e., either through a member drug store of the California Pharmaceutical Association or at a VA regional office pharmacy).

Question: **If C.P.S. rejects a physician's claim because the services rendered are not covered by the patient's C.P.S. contract, is the patient then fully responsible for payment of such services?**

Answer: Yes. All C.P.S. members are responsible for all services which are not benefits of their contracts.

The avoidance of this or other types of incorrect billing is preferable, from all points of view, to later correction. Some of the methods used by C.P.S. to prevent incorrect billing are: (1) Supplying information to members about services that are, and are not, covered by their contracts; (2) utilizing the C.P.S. Physician Relations Department to inform and instruct physicians' nurses and secretaries about C.P.S. billing and contracts; (3) the Physician's Manual, which describes benefits of C.P.S. contracts in relation to code number which appears on membership cards; the telephone answering section of the Medical Department (in C.P.S. offices in San Francisco and Los Angeles) which serves as a source of immediate information regarding contracts, benefits, exclusions, etc., for physicians and hospitals.

Question: **If a member's income is less than the C.P.S. income ceiling, does the income clause apply even for services which are not covered by his contract; or may the physician charge his private fee?**

Answer: The income clause is an integral part of every C.P.S. member's contract, but its application does not extend beyond the provisions of the contract. Services not covered by a member's contract are not affected by the income clause. Therefore, in the instance cited by the question, the physician may charge his private fee.

Question: **If I perform surgical operation on a C.P.S. patient who does not have medical coverage, does the fee I receive from C.P.S. for the surgical procedure cover preoperative medical services and surgical consultations which preceded operation?**

Answer: No. Benefits under the C.P.S. surgical contract commence from *the time actual operation is performed,* and do not include medical services which may have preceded operation. The member, not having medical coverage, would be responsible for such services.

Question: **How long, on the average, does it take C.P.S. to process and pay a physician's bill?**

Answer: If the bill is received by the C.P.S. Medical Department by the fifteenth of the month, it will normally be paid by the tenth of the following month. Delays may occur, however, in cases of treatment for accidental injury or when a billing form does not provide sufficient information and the physician must be contacted.

Question: **Why does it take C.P.S. longer to make payment on an accident case than on other cases?**

Answer: There is necessarily a slight delay in payment on accident cases, perhaps a few weeks, because of the possibility of third party liability in the accident.

If C.P.S. finds, upon investigation, that there is no third party liability, payment is made without further delay. If the possibility of third party liability exists, payment is made if and when C.P.S. obtains a signed statement from the member, stating that C.P.S. will be reimbursed when the third party makes financial settlement with the member. The physician, meanwhile, is advised of steps being taken by C.P.S. and of pertinent legal aspects of the case which are of interest to him. If, ultimately, the third party liability is denied as the result of legal or other action, the physician is assured of payment from C.P.S. in accordance with the member's contract and the C.P.S. Fee Schedule.

Question: **Is it the physician's responsibility to find out if a patient belongs to C.P.S., or is it the patient's responsibility to make this fact known?**

Answer: It is the patient's responsibility, and he should do it at the time of the first visit. Under strict interpretation of C.P.S. contracts, the member is not entitled to contract benefits if he does not make his C.P.S. membership known. However, physicians and their nurses, secretaries and receptionists can help avoid such situations (and contribute to good doctor-patient relationships) by asking new patients, "Do you have any form of health insurance?" or some similar question. The C.P.S. Physician Member plaque (carrying the words "please present your card during first visit") also should be placed where it will be seen and be a reminder to patients.

NEWS and NOTES

NATIONAL • STATE • COUNTY

LOS ANGELES

Grants in support of research being carried on by faculty members of two Southern California medical schools were announced recently by the John and Mary R. Markle Foundation. One was awarded to the University of California School of Medicine, Los Angeles, to support work in parasitology and tropical medicine by Dr. Edward K. Markell, assistant professor of infectious diseases; and the other to the University of Southern California School of Medicine for work in pediatrics and hematology by Dr. Phillip Sturgeon, assistant professor of pediatrics. The awards are $6,000 a year for a five-year period.

* * *

Dr. Robert R. Commons, assistant clinical professor of medicine at University of Southern California School of Medicine, was elected chairman of the Western Section of the American Federation of Clinical Research at the annual meeting at Carmel in January.

* * *

The Medical Women's Society of Los Angeles County has extended an invitation to the **visiting women physicians** of the California Medical Association to an informal hour from 4 to 6 p.m. on Sunday, April 27, Biltmore Hotel.

* * *

The California Society of Allergy will hold a reception and dinner Tuesday evening, April 29, in Conference Room 8 of the Biltmore Hotel, Los Angeles, and a luncheon meeting at noon the following day. Reservations may be made with Dr. Elizabeth A. Sirmay, 133 South Lasky Drive, Beverly Hills. Telephone: CRestview 5-5351, extension 226.

* * *

Dr. A. J. Carlson will be the principal speaker at a regional conference in observance of National Social Hygiene Day, April 23, in Los Angeles. He will discuss the question, "Can syphilis and gonorrhea be eliminated from the human race?" Dr. Carlson is professor emeritus of physiology at the University of Chicago and an honorary vice-president of the American Social Hygiene Association, which with the VD Council of the City and County of Los Angeles is sponsoring the meeting.

SACRAMENTO

The annual convention of the **California Dietetic Association** will be held on May 22, 23 and the morning of the 24th at the Hotel El Rancho, Sacramento. The program will present sections on public relations, diet therapy, food administration, school lunch, nutrition, and other topics of interest to dietitians and those in allied professions. Registration fee is $1.50 for the three-day session. Non-members are welcome to attend all general sessions.

SAN FRANCISCO

Dr. Anthony J. J. Rourke, superintendent of Stanford University Hospitals, soon will leave that post to become executive director of the Hospital Council of Greater New York. Dr. Rourke, who will take over his new duties July 1, 1952, is this year's president of the American Hospital Association.

The purpose of the organization which Dr. Rourke is to serve is to aid in the coordination and improvement of hospital and health services in New York City and to plan the development of those services in relation to community needs.

* * *

One of the two remaining lectures in the Stanford University School of Medicine **popular medical lectures** will be given April 23, and the other May 7. On the earlier date Dr. Anthony J. J. Rourke will talk on "The Age of Medical Miracles," and on May 7 Dr. Lyman M. Stowe will discuss "Natural Childbirth—What It Is and What It Isn't." Both lectures are to be given at Lane Hall at 8 p.m.

GENERAL

The Foundation of **The American Society of Plastic and Reconstructive Surgery** has offered awards in junior and senior classifications for the best original essays in this field.

Awards in the junior classification (residents and surgeons who have practiced in the field not more than five years) are two six-month scholarships in leading plastic surgery services in the United States, England and Italy.

In the senior classification the award is the Foundation's annual prize, a silver plaque, for the best essay presented at the annual meeting of the organization.

All entries must be received by the Award Committee not later than September 1, 1952. Further inquiries should be addressed to The Award Committee, Jacques W. Maliniac, M.D., 11 East 68th Street, New York 21, N.Y.

* * *

The Western Association of Industrial Physicians and Surgeons will hold its eleventh annual meeting at the Biltmore Hotel in Los Angeles on Saturday, April 26, 1952, the day before the opening of the California Medical Association annual meeting. A feature of the meeting will be a panel discussion on the medical administrative problems of unemployment compensation disability insurance, which, it was pointed out, affect all practicing physicians who are called upon to fill out reports for disability insurance purposes. The panel discussion will be held in the Music Room, beginning at 2 p.m. The full program will begin at 9 o'clock and continue all day.

* * *

The annual meeting of the California Chapter of the **American College of Chest Physicians** will be held April 26 at the Beverly Wilshire Hotel, Beverly Hills. The meeting will open at 9 o'clock in the morning and continue until 4:45 p.m.

POSTGRADUATE EDUCATION NOTICES

UNIVERSITY OF CALIFORNIA SCHOOL OF MEDICINE

Cardiovascular Diseases (mornings), Electrocardiography (afternoons):

Date: April 28 through May 3 at the Medical Center.

Psychiatry and Neurology—The Langley Porter Clinic.

Date: August 25 through October 31, 1952, ten weeks, full time.

Fee: Fee for the course is $200.

The course is particularly designed to prepare psychiatrists and neurologists for taking the examinations of the American Board of Psychiatry and Neurology.

Contact: Stacy R. Mettier, M.D., Head Postgraduate Instruction, Medical Extension, University of California Medical Center, San Francisco 22.

UNIVERSITY OF SOUTHERN CALIFORNIA SCHOOL OF MEDICINE

Survey Course for General Practitioners—No. 852—Los Angeles County Hospital and the Children's Hospital.

Date: April 14 through 18, 1952, full time.

Fee: Fee for the course is $50; a deposit of $10 is required; this is not refundable. Mail check to University of Southern California, Medical Extension Education, Box 158, 1200 North State Street, Los Angeles 33, Calif.

Anyone not desiring the complete five-day course may register for one or more days. The fee for fewer than five days will be $10 per day.

Contact: Gordon E. Goodhart, M.D., Director, Medical Extension Education.

Guest Lecturers: Dr. Paul Starr, Professor of Medicine; Dr. Helen E. Martin, Associate Professor of Medicine; Dr. C. J. Berne, Professor of Surgery; Dr. Ray A. Carter, Professor of Radiology; Dr. Merl J. Carson, Professor of Pediatrics; Dr. Verne R. Mason, Clinical Professor of Medicine.

Recent Advances in Surgery, Obstetrics and Gynecology—No. 869—Ventura County Hospital.

Date: April 11 to June 27, 1952, part time.

Fee: Fee for the course is $50. Mail check to University of Southern California, Medical Extension Education, Box 158, 1200 North State Street, Los Angeles 33, Calif.

Contact: Gordon E. Goodhart, M.D., Director, Medical Extension Education.

INFORMATION

The New Amendment to the Food and Drugs Act

O. V. McCracken, Executive Secretary of California Pharmaceutical Association

The Durham Humphrey amendment to the Federal Food, Drug, and Cosmetic Act (Public Law 215, 82nd Congress) became fully effective April 6.

To the greatest degree this law affects manufacturers, producers and distributors of drugs in interstate commerce, and pharmacists and others who sell or dispense these drugs to the ultimate user.

The demand for a change in the law was made by pharmacists operating retail stores because of the existing confusion with respect to the labeling of drugs, the gross misuse of the prescription legend by manufacturers, and rulings of the Food and Drug Commissioner regarding refilling prescriptions.

The actual wording of the Federal law and regulations issued pursuant to it made any prescription, unless it was an original prescriptions written by the prescriber, unlawful. No phone prescription even for the simplest drug was lawful and no phone authorization was recognized either for an original order or for a refill. The Administrator subsequently modified this position by stating that confirmation in writing within 72 hours would be acceptable.

In spite of the fact that pharmacists working with physicians to give the patient a maximum service disregarded to some extent these rigid regulations, there were nevertheless numerous instances where the pharmacist got into serious trouble with the law enforcement officers because he was trying to carry out a traditional policy long established as ethical.

The climax to the utterly ridiculous position of the Administrator (at that time Dr. Paul Dunbar) came in an address delivered at the convention of the National Association of Retail Druggists at Atlantic City, in which he said that the refilling of *any* prescription was not in fact the dispensing of a prescription, but actually a sale over the counter of the drug involved. And the suggestion was made that the pharmacist could, if the drug called for was one that could be sold without a prescription, sell it to the patient by merely labeling it with its common name and any directions that might be required in conformity with food and drug law requirements.

This was the straw that really broke the camel's back, and a longsuffering and tolerant retail drug group got up on its hind legs and started to fight.

This prescription question was not the only bad feature of the law. Another just as vexing and troublesome was the question of the use of the prescription legend on drugs. Some manufacturers were using this legend on the simplest of drugs. The use of this legend on calcium carbonate was a striking example of such misuse.

The purpose of the amendment was to clarify and determine which drugs should be dispensed solely on prescription and which could be sold without prescription. The labeling was to be the criterion. The contention was that a drug safe for lay use should not bear the prescription legend, and that one unsafe for use except under professional advice should bear it.

California Pharmaceutical Association believes the physician should be the one to determine the use of all drugs bearing the prescription legend and his authority to the pharmacist should be the controlling factor of their distribution. This condition is provided for in the amended law.

And for the first time in the law an objective definition is given of the kind of drug that should bear the prescription legend. In fact, if it qualifies it *must* bear the legend. That is where the physician comes in. Since the new classification definitely determines the distribution of the drug only on prescription, the physician has a privilege and an obligation.

The privilege is one of complete control, which is given in the interest of safety and public health, and the obligation is to see that the pharmacist has the proper authority to dispense and that he is given instructions regarding refills if refills are intended. The control for use of the drug limited to prescriptions is just as effective with respect to refills as it is to the first order. Within this scope of obligation the patient deserves first consideration, for in the case of a need for continuing medication the patient should be able to obtain his prescription with the least inconvenience to himself.

For the pharmacists, the regulations on this new law make about 12 typed pages. They are not too hard to comply with because the law is fairly clear. As to the basic points of the new law of interest to physicians:

A physician may write or telephone *any* prescription (except a narcotic prescription) to the pharmacist and it is a legal order, requiring no confirmation in writing.

He may, in writing or by telephone, authorize the refilling of *any* prescription (except a narcotic prescription) and it is a legal prescription requiring no confirmation in writing. Under the Federal law, he may, either in written prescription or in oral prescription, give *any* authority he desires regarding the refilling of such prescription—*but in California barbiturates would be excepted from this provision in the Federal law; the California law requires a separate order for each dispensing of any hypnotic drug.*

A physician may give an order or prescription for drugs for a patient, without doing so personally, and the pharmacist can fill such order, if he is satisfied that the order is by "express authority" of the prescriber. Such "express authority" would come through an employee of the physician to whom such instructions were given, and not through a patient.

BOOK REVIEWS

TEXTBOOK OF BIOCHEMISTRY—Edward Staunton West, Ph.D., Professor of Biochemistry, University of Oregon Medical School; and Wilbert R. Todd, Ph.D., Associate Professor of Biochemistry, University of Oregon Medical School. The Macmillan Company, 1951. 1,345 pp. $12.00.

This book should rapidly become the most quoted American textbook of biochemistry, not only because it is the most comprehensive of the recent books in this field, but also because it is interestingly and clearly written. It is distinctly a treatise on the chemistry of biological compounds rather than on chemical physiology, although there is enough discussion of the latter to show the dynamic character of the chemistry of protoplasm. The subject matter is logically arranged, beginning with a brief introductory statement concerning the composition of protoplasm, then five chapters, totaling 150 pages, on physical chemistry as applied to biology. Then follow chapters on the pure chemistry of lipids, carbohydrates, proteins and nucleoproteins which lay the basis for the understanding of the metabolism of these substances and complexes in the body. Chapters XIII to XVIII describe the composition of the body, the digestion and absorption of food and detoxication mechanism. Chapter XIX on the Chemistry of Respiration, Acid-Base Balance, and Electrolyte and Water Balance devotes 68 pages to the correlation of these various factors in body chemistry, with detailed chemical and mathematical formulas to describe the reactions. This chapter will be difficult for the medical student to grasp in the short time permitted in the medical curriculum for the study of biochemistry, but for graduate students and for research workers and scholars, it is a very valuable portion of the book. By contrast, the succeeding Chapter XX, entitled "Energy Metabolism," devotes very little space to mathematics, but is a clear description of the factors involved.

The biological role, as well as the pure chemistry of the vitamins, is clearly described in 123 pages in Chapter XXI. Chapter XXII on Biological Oxidation and Reduction is another mathematical discussion which requires patient reading and a considerable appreciation of physical chemistry to understand. The remaining chapters on metabolism of food constituents and products of digestion are well written and include modern concepts of the chemical reactions of intermediary metabolic products, although Figure 63, which attempts to summarize the breakdown of glucose is too complex to be comprehended without long study. Chapter XXXII on Urine Formation and Composition is a fine contribution to the literature on this subject and discusses just enough of the physiology of the kidney to explain the composition of the urine.

Especially outstanding features of the book are the manner of discussion of the chemistry of lipids, carbohydrates and protein, with profuse use of structural formulas and the chemical logic to substantiate the proposed structures; many excellent tables such as those on molecular weights and isoelectric points for proteins, composition of blood and normal ranges of concentrations of a large number of blood constituents, biological values of food proteins, the integration of fat, protein and carbohydrate metabolism through the tricarboxylic acid cycle; an excellent discussion of the biochemistry of experimental and human diabetes and of the effects of insulin; the clear discussion of transamination and transmethylation; the metabolism of alcohol and mineral metabolism. The chapter on hormones, however, is far too brief, although accurate as far as it goes and the chapter on antimetabolic agents is truly disappointing, in that it includes a discussion of sulfonamides, antibiotics, insecticides and herbicides without giving much information as to the antimetabolic mechanisms, and there is no discussion at all of the anti-cancer agents such as nitrogen mustards and folic acid antagonists nor of the other anti-vitamin compounds.

Although the book is arranged logically, the reviewer would rather have found a more pedagogical arrangement; for example, Chapter XIII on the Composition of Tissues would have been better as an amplification of Chapter I and would have made more clear to the student the importance of the following chapters on physical chemistry and on the chemistry of bodily constituents. As the book now stands, there is not the motivation of an understanding correlation to make these otherwise "dry chapters" interesting.

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OBSTETRICAL PRACTICE—Fifth Edition—Alfred C. Beck, M.D., Professor Emeritus of Obstetrics and Gynecology, State University of New York, College of Medicine, at New York City. The Williams and Wilkins Company, Baltimore, 1951. 1073 pages. $10.00.

This is an excellent textbook of obstetrics, simply and concisely written. In a brief preface the author outlines the revisions and additions made since the fourth edition was published in 1947. These include newer concepts of the following: Development of the ovaries, the life-cycle of the corpus luteum, the histology of the endometrium and vascular changes in relation to hormone influences, and the implantation and development of the fertilized ovum. Chapter V on the physiology of the placenta and Chapter VI on the physiology of the fetus have been rewritten. The chapter on the physiology of the maternal organism during pregnancy includes recent findings regarding the uterine musculature and fluid balance. There is an excellent summary of the hormone shifts in pregnancy. The newer tests for pregnancy, including the frog test and the rapid rat test, are outlined in Chapter VII.

The material on the management of pregnancy is notable for its specific outline of dietary needs. The actual foods and amounts necessary to meet these needs are given.

The discussion of pelvimetry is up to date and includes both the Thoms and the Caldwell Moloy techniques and nomenclature. The inadequacy of external pelvimetry is emphasized.

The two chapters on hyperemesis gravidarum and preeclampsia and eclampsia clearly and concisely outline the available knowledge regarding the etiology and treatment of these puzzling conditions. The references are comprehensive. Under the heading of medical complications is a discussion of the Rh factor, abbreviated, but adequate.

Other subjects which have been brought up to date in this textbook are the treatment of trichomonas and yeast infections in pregnancy, and the use of intravenous drip pituitary solution to stimulate uterine contractions. Mention is made of anticoagulant therapy in thromboembolism. A. B. Johnson's technique for handling inversion of the uterus by pushing the whole mass high into the abdomen and holding it there until the uterine ligaments slowly unfold is credited as being a contribution.

The two tables in the chapter on puerperal infection, giving the relation of anemia to postpartum morbidity and of various delivery manipulations and procedures to morbidity, respectively, are thought-provoking.

The book is not above criticism. The local antiseptics mentioned, iodine and chlorothymol, are rarely used and there are a wealth of new and more adequate solutions. Although the use of penicillin, streptomycin, aureomycin and sulfa is given, the later, broader spectrum antibiotics are not mentioned.

The material on repair of lacerations and episiotomies is very limited.

In the description of cesarean section there is no mention of the transperitoneal transverse opening of the uterus which has gained popularity in many sections. The use of spinal anesthesia is given very little support. No mention is made of fetal abnormalities or of circumcision techniques. Moreover, the hazard of thromboembolic accidents following myomectomy at the time of cesarean section is not mentioned, and one could wish for a more detailed discussion of anticoagulant therapy.

However, the text is well arranged and well written, and the plates and charts are clear and to the point. Especially commendable is the arrangement of the historical data, biographical notes and pictures of the great men who have contributed to our knowledge and techniques. These are placed at the beginning or end of appropriate chapters without interfering with the text.

The appendix consists of 22 excellent x-ray reproductions covering the following subjects: Pelvimetry, presentations, multiple pregnancies, fetal anomalies and urological changes.

It is a valuable book for both students and practitioners.

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BACTERIAL AND VIRUS DISEASES: Antisera, Toxoids, Vaccines and Tuberculins in Prophylaxis and Treatment — H. J. Parish, M.D., F.R.C.P.E., D.P.H., Clinical Research Director, Wellcome Foundation Ltd. Second edition. The Williams and Wilkins Company, Baltimore, 1951. 204 pages. $2.50.

This little book is intended to be a brief guide to the use of biologics for the prevention or treatment of infectious disease. Brief descriptions of the histories of the development of many of the products and of the methods of preparation are included. It reflects essentially the points of view of the Wellcome Foundation in England. An excellent index makes the useful information in the book readily accessible.

The development of antimicrobial chemotherapy has superseded most of the antibacterial sera in therapy and this fact is recognized in the brief space devoted to them. The chapter might well be omitted.

Many of the other substances described for treatment and for the production of active immunity are of no or questionable value. Critiques permitting the inexperienced physician to choose between valuable or essential procedures and those without merit are not supplied. It would be necessary for him to consult other texts for this information. Most of these would contain descriptions of the techniques for the use of the effective biological materials. This book will be of little value to the practicing physician and is not sufficiently detailed and critical to find a place in the library of medical student or investigator.

* * *

A MANUAL OF ORTHOPTICS—Julia E. Lancaster, M.A., San Francisco Ophthalmic Laboratory, San Francisco. Charles C. Thomas, Publisher, Springfield, Illinois, 1951. 199 pages. $5.50.

This book has 191 pages of subject matter and is quite unique in that as a treatise on orthoptics it is a pioneer.

The book is divided into 18 chapters beginning with the functional development of visual skills in the child. The last chapter deals with orthoptics in the adult.

Between these two chapters the teaching of visual skills is very well handled, especially since this is a pioneer effort. In a later edition, some of the redundant material can be eliminated.

This book gives a practical approach to the evaluating and the development of visual skills both with and without the aid of surgery and of refraction. Since the work is largely with children, the proper handling and evaluating of a child is carefully and ably discussed. The varied forms of treatment are clearly given and could be followed with reasonable ease.

The discussions of anomalous correspondence, physiologic and non-physiologic diplopia, and suppression should be read by all ophthalmologists. The discussions are lucid and in the reviewer's opinion would be extremely valuable to the surgeon in his diagnosis, his evaluation of treatment, and his prognosis in each tropia case.

The chapters on treatment are easily comprehended and should be read by ophthalmologists as well as orthoptic technicians in order to better coordinate their treatment of their mutual cases.

The reviewer may be over-enthusiastic about this book, but he feels that it fills a much neglected area of understanding in the field of ophthalmology.

* * *

THE CHANGING YEARS — Madeline Gray. Doubleday & Company, Inc., 1951. 224 pages. $2.75.

The expressed purpose behind the production of this volume is certainly an admirable one. Every physician is recurrently appalled at the ignorance shown by women regarding their menstrual function, and in no facet is this more pronounced than in that part of the menstrual function which occurs at the time of the menopause. Undoubtedly this ignorance is the product of the taboos with which mankind, civilized and uncivilized, has been accustomed to surround sexual matters in general, especially those involving the female. Thus a simple explanation of the body physiology as it relates to menstruation, and in particular as it changes at the time of the menopause, is of great value.

It appears, from the long list of physicians and publications which the author has consulted and which is included in a separate section at the back of the book, that considerable time and effort have been expended in the preparation of "The Changing Years," and it is unfortunate that a better understanding of some of the matters which were heard and read was not gained before they were set down in black and white. A number of gross anatomicophysiological errors are evident, and some concepts which are presented as fact are in reality still the subject of considerable discussion and controversy. To the physician these defects are distracting, and detract from the value of the book as a whole. In the lay mind the menopause is already surrounded by so much superstition and fancy that one hesitates to recommend any statement which might tend to increase the confusion in the mind of an uncritical reader.

However, it would appear that by and large the great majority of women might well derive considerable degrees of comfort from the presentation of the subject as a whole. Great benefit should accrue from the attitude that the menopause is not a "change of life" in the sense that such an expression implies a total change of direction, but that it is simply one more of the progressive steps through which one inevitably passes during the course of life. The specific reassurances that the menopause does not necessarily mean cancer, or loss of sexual power and drive, or the approach to insanity, or any one of a host of other unpleasantnesses should bring readers a sense of relaxation which will tend to help them weather whatever difficulties their individual menopauses may produce.

PROGRESS IN NEUROLOGY AND PSYCHIATRY—An Annual Review—Volume VI. Edited by E. A. Spiegel, M.D., Professor and Head of the Department of Experimental Neurology, Temple University School of Medicine, Philadelphia. Grune and Stratton, New York, 1951. 562 pages. $10.00.

This review of the year's literature in neurology and psychiatry has become so well established as to be a fixture. The quality of the various chapters varies as it must inevitably in such a compilation, but generally it is very good. The book should be in the hands of all specialists in the field, and selected portions of it make very profitable reading for the general practitioner as well. As in all such reviews the approach of the authors must be a compromise, with the result that all too frequently the treatment is too specialized and detailed for the reader seeking a broad knowledge of the field and yet does not embrace sufficient specific information for the reader interested in the restricted aspect of the subject under consideration.

Of the 562 pages, 175 are devoted to psychiatry. When one considers that the greatest number of readers will be in this specialty this may seem too little, yet an evaluation of the material presented lead this reviewer to the opposite conclusion. Several of the chapters are of unusual excellence, among which might be mentioned that on Peripheral Nerve Surgery by Woodhall and on Clinical Psychiatry by Simon and Bowman. The latter sound a word of caution regarding the present tendency of their colleagues to bring forth cures for the social ills of the world.

* * *

DYNAMIC PSYCHIATRY — Basic Principles — Volume One—Louis S. London, M.D. Corinthian Publications, Inc., New York 16. 98 pages. $2.00.

Presumably this is volume one of a series on so-called dynamic psychiatry. It is a curious mixture of the history of psychiatric thought and a discussion of the concept of the libido from a psychoanalytic point of view. Although the first chapter is entitled "The Evaluation of Psychotherapeutics from Antiquity to the Time of Freud," it ends with a single statement about the "reform of the insane asylums" by Tuke and Pinel in 1792, and disposes of the last 150 years of psychiatry with the following remark: "The further history of psychiatry is the story of the development of Freudianism, psychoanalysis and of the various schools of thought from which evolve the psychotherapeutic methods of today."! If anyone is interested in the origin and development of present day psychiatric concepts, he will not find them here.

The latter half of this little book is devoted to an explanation of the psychology of the libido as developed by Freud, Jung, Abraham and others; the style is lacking in clarity, and controversial questions are dogmatically presented with little or no elaboration. For example, "When women marry late in life due to repressed libido, they are more susceptible to trauma. This is due to the gelatinization or congealing of the libido and acts like the hardening of the skin causing perineal tears." The author's apparently hostile attitude to his patients is exemplified by his statement, "Those of us who have worked in state hospitals know how cowardly the insane are, and neurotics are likewise cowards." One will search in vain to find here any clear concept of dynamic psychiatry or principles of psychotherapy.

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AMPUTATION PROSTHETIC SERVICE — Earle H. Daniel, Director of Prosthetic Service, Institute of Physical Medicine and Rehabilitation, New York University. The Williams and Wilkins Company, Baltimore, 1950. $7.00.

The author has presented a good comprehensive review of the general problem of amputation as it pertains to both the lower and upper extremities. The surgical aspects and indications are not discussed. He has, however, discussed and presented reasons for choosing certain sites of amputation in both upper and lower extremities. These various sites are discussed from their functional standpoints as applied to the prosthesis which the patient will wear.

The care and preparation of a stump for the fitting of a prosthesis as well as presenting a program of exercises for the purpose of obtaining better control and strength of a stump are outlined. Psychological treatment of the amputee is most important and is well presented with suggestions for overcoming the rather common condition which he speaks of as "amputee's disease." There is also included a good discussion as to the selection of an artificial limb and its construction from the various types of material currently in use. The benefits and indications of the suction socket prosthesis for the above-knee amputation are shown. He also reviews the problems and types of prosthesis for upper extremity amputations including the satisfactory but not common cineplastic type of amputation and the prosthesis used for it. Certain problems are also present in the fitting of artificial limbs for children and changing conditions due to growth must be recognized.

It is a well illustrated book and with the general good discussion, should serve well as a reference book for amputees, limb fitters and surgeons. Surgeons who are not too well acquainted with the general problem of prosthetic devices and their application to amputation stumps could obtain pertinent information from it. It should be a valuable addition to medical libraries.

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BONE AND JOINT DISEASES—Pathology Correlated with Roentgenological and Clinical Features — J. Vernon Luck, M.S. (Ortho.), M.D., F.A.C.S., F.I.C.S., Assistant Clinical Professor of Orthopedic Surgery, University of Southern California. Charles C. Thomas, Publisher, Springfield, 1950. $16.50.

The reviewer decided after first inspecting this volume that it warranted more than hasty scanning. The text has been used as a reference book, and it has not been found wanting. General practitioners and members of various specialties will find the work helpful, because in the past it has been necessary for the physician to look up many references and to consult many textbooks to obtain a well rounded concept of any one of the diseases affecting bones and joints. This volume correlates the known pathology with roentgenological and clinical features.

To be more specific, the author includes recent concepts of certain pathologic entities not included in older textbooks. For instance, he reviews the modern ideas about osteoid osteomas and fibrous dysplasia of bone. Again, the general practitioner or specialist may want and find here concise information about coccidioides, yaws, echinococcosis, brucellosis, actinomycosis, blastomycosis, leprosy, etc., to enable him to make a diagnosis and institute proper treatment for patients under his care.

The text is illustrated by many excellent reproductions of gross as well as of microscopic sections portraying many phases of bone and joint pathology. A considerable number of these are in color. It is evident that the author had available many excellent roentgenograms, and very little detail has been lost in the reproductions.

The orthopedic specialist will likely be reminded that he had recognized the need of such a volume but had never put forth the effort needed to get the material together. He will also agree that as Dr. Luck has contributed such a helpful work, Dr. Luck is also duty-bound to continue to collect material and to revise his text as more information becomes available for subsequent volumes.

A TEXTBOOK OF CLINICAL NEUROLOGY with an Introduction to the History of Neurology, Seventh Edition—Israel S. Wechsler, M.D., Clinical Professor of Neurology, Columbia University, New York. W. B. Saunders Company, Philadelphia, 1952. $9.50.

It is now 25 years since this textbook of clinical neurology first appeared; through seven editions the author has kept the book thoroughly abreast of the times. In the present edition obsolete matter has been eliminated and new material presented where indicated with little regard for the effort involved, effecting a definite improvement in what has always been a very good text.

The initial hundred pages devoted to neurological examination are very worth while. Thereafter, there is a division into three main sections, devoted to the spinal cord, the peripheral nerves, and the brain. Although this topographical separation makes for a certain amount of duplication, it is a particularly satisfactory one for the student. The final short chapter on the neuroses brings up the question as to whether such material should be included in a neurological text. Certainly it is never adequate from the standpoint of the psychiatrist, and in general seems inappropriate in a volume devoted otherwise exclusively to organic disease.

This is a book which can be recommended both to the student of medicine and to the practitioner as an adequate source of instruction and reference.

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THE HEALTH OF THE MIND—J. R. Rees, M.D., Director, World Federation for Mental Health. W. W. Norton & Company, Inc., New York, 1951. $2.75.

This little volume is obviously directed to the ordinary layman with the avowed purpose of giving him some general ideas about mental hygiene. After a brief introduction about the historical development of psychiatry, simple definitions of psychoses, psychoneuroses, and character disorders are presented along with brief descriptions of Freudian, Adlerian and Jungian psychology. A short outline of "body mechanisms" with particular emphasis on the role of the central nervous system and of the glands of internal secretion is designed to give the reader some slight knowledge of the individual's "physical machine." The role of emotions, instincts, and "sentiments" in this total functioning of the personality is correlated with structure in such a manner that the general concept of the close interaction of mind and body is made quite clear without the use of highly technical language.

Psychological mechanisms, such as projection, transference, identification, compensation, repression and conversion are illustrated by examples of behavior and attitude in everyday life with minimal emphasis on the pathological, and in this way the author avoids arousing an excess of anxiety in his readers. The chapter on the causes and cure of mental breakdown is also presented in a simple, straightforward manner. Various methods of therapy, both somatic and psychological, are mentioned with no pretense that there is any panacea for the difficulties arising from emotional conflicts. Problems that may arise during early life, childhood, adolescence, maturity and old age are all discussed in a sensitive fashion, and nowhere, not even in the chapter on sex education, is there a tendency to lapse into technical polysyllabic psychiatric jargon. The author states, "There can be nothing in our mental life that we should fear to look at. To ignore those things which need alteration or revaluation is a foolish and short-sighted method. Self-knowledge is essential if we would have progress for ourselves and for society."

This book may be enthusiastically recommended by the physician to his patients, especially to those who ask for some simple exposition of psychological problems and mental hygiene.

SURGERY OF PERIPHERAL NERVES—Emil Seletz, M.D., F.A.C.S., F.I.C.S.; Assistant Clinical Professor of Neurological Surgery, University of Southern California School of Medicine; Art Editor, Tom Jones, Professor of Medical and Dental Illustrations and Head of Department, University of Illinois. Charles C. Thomas, Publisher, Springfield, Ill., 1951. 185 pages. $10.75.

Dr. Seletz' book represents the result of his broad and detailed experience with 2,037 peripheral nerve injuries at the Wakeman Hospital Center during World War II. The book is divided into 19 chapters, the first of which is devoted to the principles and technique of nerve surgery. This subject is developed briefly; the chapter is in no sense a comprehensive treatise and its brevity implies familiarity with peripheral nerve surgery on the part of the reader. The succeeding chapters, 18 in all, consider the anatomy, clinical diagnosis of lesions and surgical treatment thereof for each major peripheral nerve. The text includes a clear, elementary discussion of the surgical anatomy and clinical picture of paralysis of each nerve. Numerous large photographs of the paralyzed limbs of patients illustrating the results of nerve injuries are included, and the anatomy of each nerve is depicted in generous sized and beautiful drawings which will be found helpful in planning the surgical approach to a given nerve. The techniques of nerve repair which are presented are the result of the author's personal experience. Emphasis is placed upon nerve exposure through fascial planes and procuring added length for neurorrhaphy with special reference to the median nerve.

Dr. Seletz' discussion and illustrations of his favorite surgical incisions will be welcome. Such descriptions of techniques successful in his large series, together with the numerous and clear pictures, constitute this book's greatest contribution to the field of nerve surgery.

This book concerns itself exclusively with nerve injuries. No consideration of other nerve lesions is included. Problems encountered in civilian life such as delayed nerve palsies are not discussed. The management of partial nerve lesions, the rate of recovery of injured nerves, the prognostic signs in following return of nerve function, the problem of reoperations and the optimum time therefor, are subjects which are omitted. Likewise omitted is a consideration of the role of neurolysis in the treatment of nerve injuries. The very brief discussion of the treatment of causalgia does not permit more than a statement of the technique which has been successful in the author's hands.

The book does not pretend to be a text, for indeed references are few and no bibliography is included.

It is beautifully produced on high-grade paper, it is readable, the illustrations are conveniently labeled, and the charts of nerve function will act as a ready review. The book deserves scrutiny by all who plan definitive surgical treatment of nerve injuries and the principles will frequently apply to the treatment of non-traumatic lesions.

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PENICILLIN DECADE, 1941-1951—Sensitizations and Toxicities—Lawrence Weld Smith, M.D., Medical Director, Commercial Solvents Corporation; and Ann Dolan Walker, R.N., former Editor, "Trained Nurse and Hospital Review." Arundel Press, Inc., Washington, D. C., 1951. 122 pages. $2.50.

Between the covers of this little book with the intriguing title of "Penicillin Decade," one finds a catalogue of all the untoward effects of this antibiotic reported in the past ten years. There are references to no less than 342 titles. Such a collection seems to present an alarming picture; one must remember that most of these penicillin reactions are not common. Aside from being a valuable work of reference, however, this compendium may remind the doctor that after all it is better to have a clear indication for the use of antibiotics than to use them indiscriminately.

ANTIBIOTIC THERAPY—Henry Welch, Ph.D., Director, Division of Antibiotics, Food and Drug Administration, Federal Security Agency of the United States Government; and Charles N. Lewis, M.D., Medical Officer, Division of Antibiotics, Food and Drug Administration, Federal Security Agency of the United States Government. The Arundel Press, Inc., Washington, D. C. $10.00.

This book of 560 pages, heavily documented, is more a work of reference than a treatise to be read through from cover to cover. The first chapters deal with the individual antibiotics in order of discovery, taking up systematically their preparation, composition, pharmacology, and antibiotic qualities. Then come sections on infections with particular bacteria or special diseases such as syphilis. Treatment is discussed in rather diagramatic and at times almost dogmatic fashion, nor do the brief definitions of disease seem to serve much purpose. It is hardly necessary to tell the medical reader that syphilis is caused by Treponema pallidum, etc., etc., or that brucellosis is caused by various forms of Brucella. Indeed one gets the impression that the writers, who are members of the Food and Drug Administration of the Federal Security Agency, are writing a treatise for general information and not entirely a manual for practicing doctors, although any practitioner will find the book invaluable. More could be said about the recent work on antibiotic synergism and antagonism.

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DIABETES CONTROL—Edward L. Bortz, M.D., Chief of Medical Service B, The Lankenau Hospital, Associate Professor of Medicine, Graduate School of Medicine, University of Pennsylvania. Lea and Febiger, Philadelphia, 1951. 264 pages. $3.50.

This book is a generally sound, up-to-date manual written for the intelligent diabetic patient in such language that he can understand it and from such a viewpoint that he can be optimistic about his condition. The physician caring for diabetes may well recommend it to his patients.

Along with these remarks of overall commendation the reviewer must note certain criticisms: There is a tendency to glibness without foundation in such comments as the one on the amount of rest one needs (page 193): "It was Henry Fielding who said that an hour of sleep before midnight was worth two afterwards and Heiser says this is still true." ... Food exchanges are first mentioned on page 62 but the system is not explained until page 109. ... The tables of weight for men and women list average rather than ideal or optimum weights as "normal" and tend to detract from an otherwise excellent chapter on weight control. . . . Although the appendix on the composition of alcoholic beverages notes that "the bold face numerals indicate the number of grams ... in an average portion," the bold face type has been unaccountably omitted (despite its presence in the text from which the table is taken).

The author is urged to remedy these defects in a later edition.

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FROM DUGOUT TO HILLTOP—Margaret R. Stewart, M.D. Murray & Gee, Inc., Culver City, 1951. 233 pages. $3.75.

Dr. Stewart's account of her life story from the pioneer home to the practice of medicine is indeed a fascinating tale. It not only is her personal story but it gives an excellent account of the United States and its rapid expansion and development in the century of any one life span. The book itself is indeed readable, it is full of humor, it has many gay spots but also it tells of tragedy and danger. It is a worthwhile book both for its human qualities and its historical account.

THE GENETICS OF MICRO-ORGANISMS—D. G. Catcheside, Reader in Plant Cytogenetics, University of Cambridge, Fellow of Trinity College, Cambridge. Pitman Publishing Corporation, 2 West 45th Street, New York 19, 1951. 223 pages. $4.50.

The field of microbial genetics has expanded dramatically during the past decade. In spite of the theoretical and practical importance it has assumed, no book dealing exclusively with inheritance and variation in micro-organisms has previously appeared. Professor Catcheside has now provided a most useful introduction to the subject, based on lectures originally prepared for biochemists specializing in microbiology.

Problems, methods, and outstanding results are outlined for representative organisms in which genetic problems have been studied intensively. Chapters devoted to genetic analysis in fungi, to gene action ("biochemical genetics") and to mutation and adaptation, are appropriately centered around the fungus Neurospora. The comparative biology of sexual reproduction is discussed with reference to a wide variety of forms, chiefly fungi, and following chapters are devoted to yeast genetics (including discussions of the adaptive enzymes and cytoplasmic inheritance) and to the genetics of protozoa (dealing chiefly with the intricate but beautiful findings on relations between nucleus, cytoplasm, and environment in Paramecium). A chapter on bacterial genetics contains an account of recombination studies and genetic mapping in *E. coli*, a thorough discussion of mutation-rate measurements, and a critique of the problem of distinguishing mutation and selection from induced adaptive change in bacterial populations. Finally, studies on mutation and recombination of bacterial viruses, and on the genetics of resistance and infectivity of the bacterium-bacteriophage system, are described. (Perusal of the highly selected bibliography of 200-odd publications reveals that an impressive number of papers have originated from universities in California.)

While certain topics (e.g. gene-controlled biosyntheses, host-parasite relations, drug resistance) bear an obvious relationship to medical problems, the author has not attempted to emphasize practical aspects, and the book will disappoint any who expect applications to be stressed. But those who desire a critical summary of numerous exciting developments in microbiology will find the book rewarding.

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A TEXTBOOK OF CLINICAL NEUROLOGY — Third Edition—J. M. Nielsen, B.S., M.D., F.A.C.P., Clinical Professor of Neurology and Psychiatry, University of Southern California. 212 illustrations. Paul B. Hoeber, Inc., 49 East 33rd Street, New York 16, N.Y., 1951. 709 pages, $10.00.

Each succeeding edition of this textbook of Neurology has shown distinct improvement, until now it must be acknowledged to be one of the most adequate texts available. Since no neurologist can be equally adept at all branches of the specialty, so one must have his preference for different textbooks for different aspects of the subject. Nielsen's work, however, shows remarkably good balance, and can be recommended to student and practitioner alike.

As is inevitable in a book of this scope, certain minor errors have crept in, particularly in fields with which the author was not too familiar from personal experience. Thus, the statement is made that the threshold of denervated muscle to galvanic stimulation is raised, while quite the contrary is the fact. Again, he speaks of muscle action potentials with "a millivoltage of 10 to 1200" where the proper word is microvoltage. Such minor slips of the pen will undoubtedly disappear from subsequent printings, and do not materially detract from the value of this really first-rate textbook.